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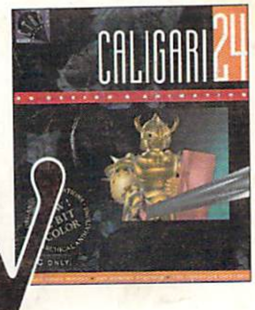
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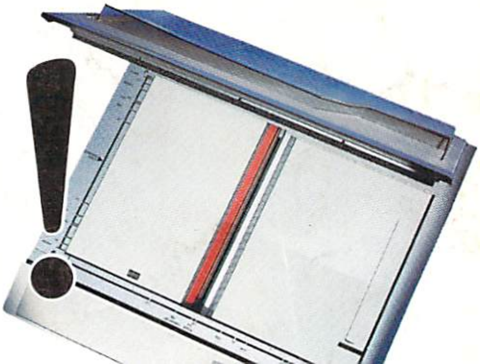


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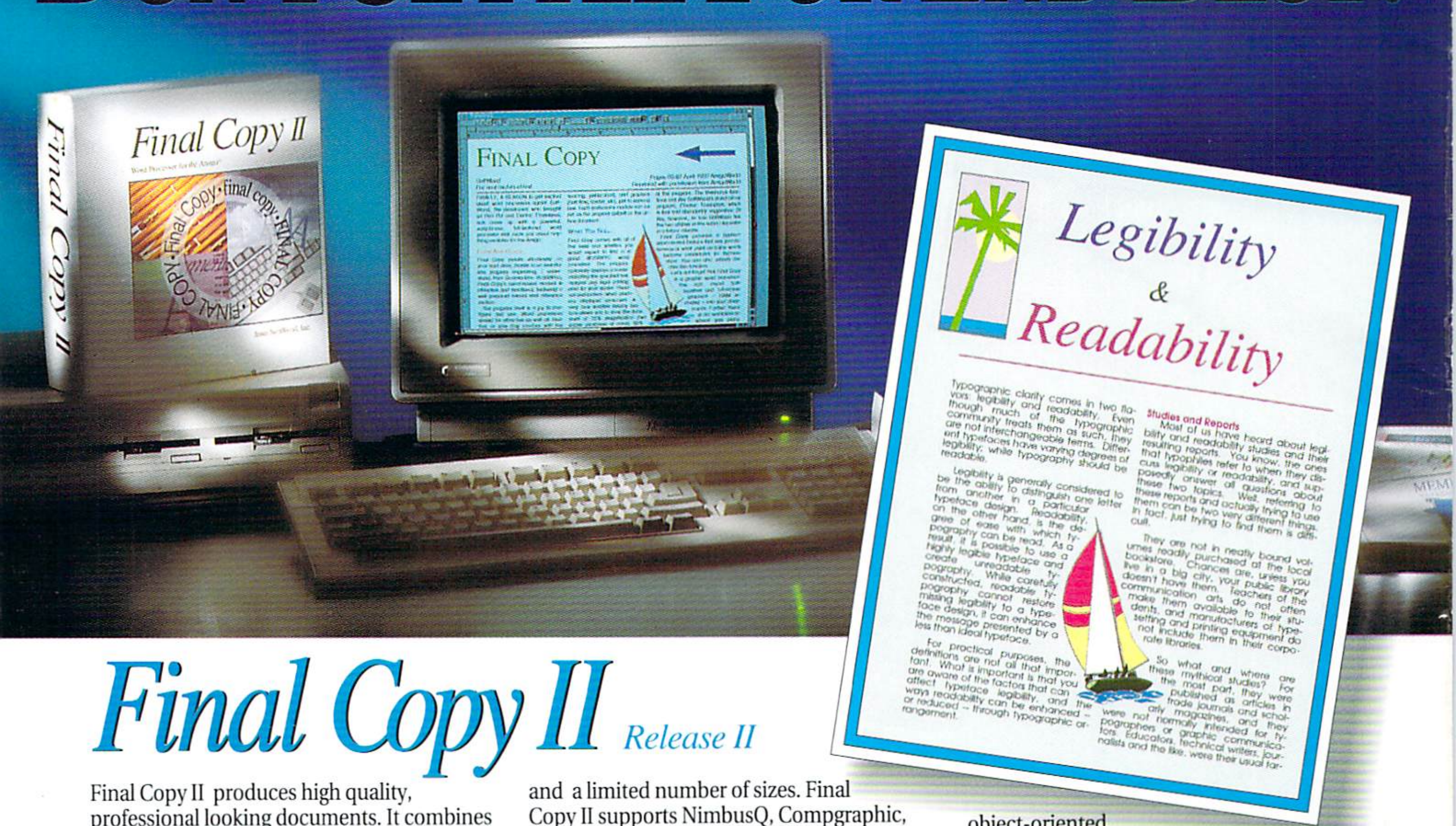








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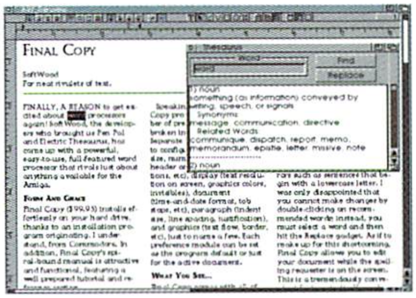
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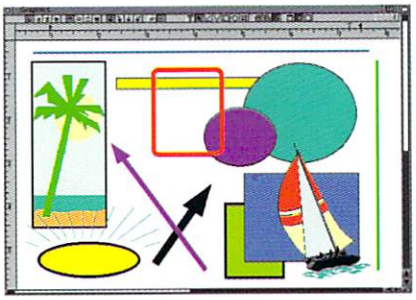
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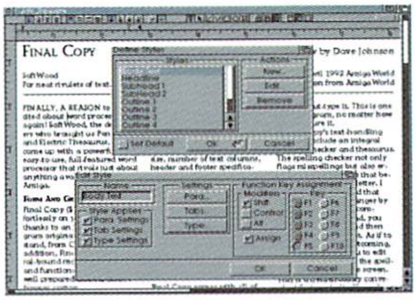
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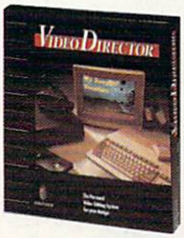
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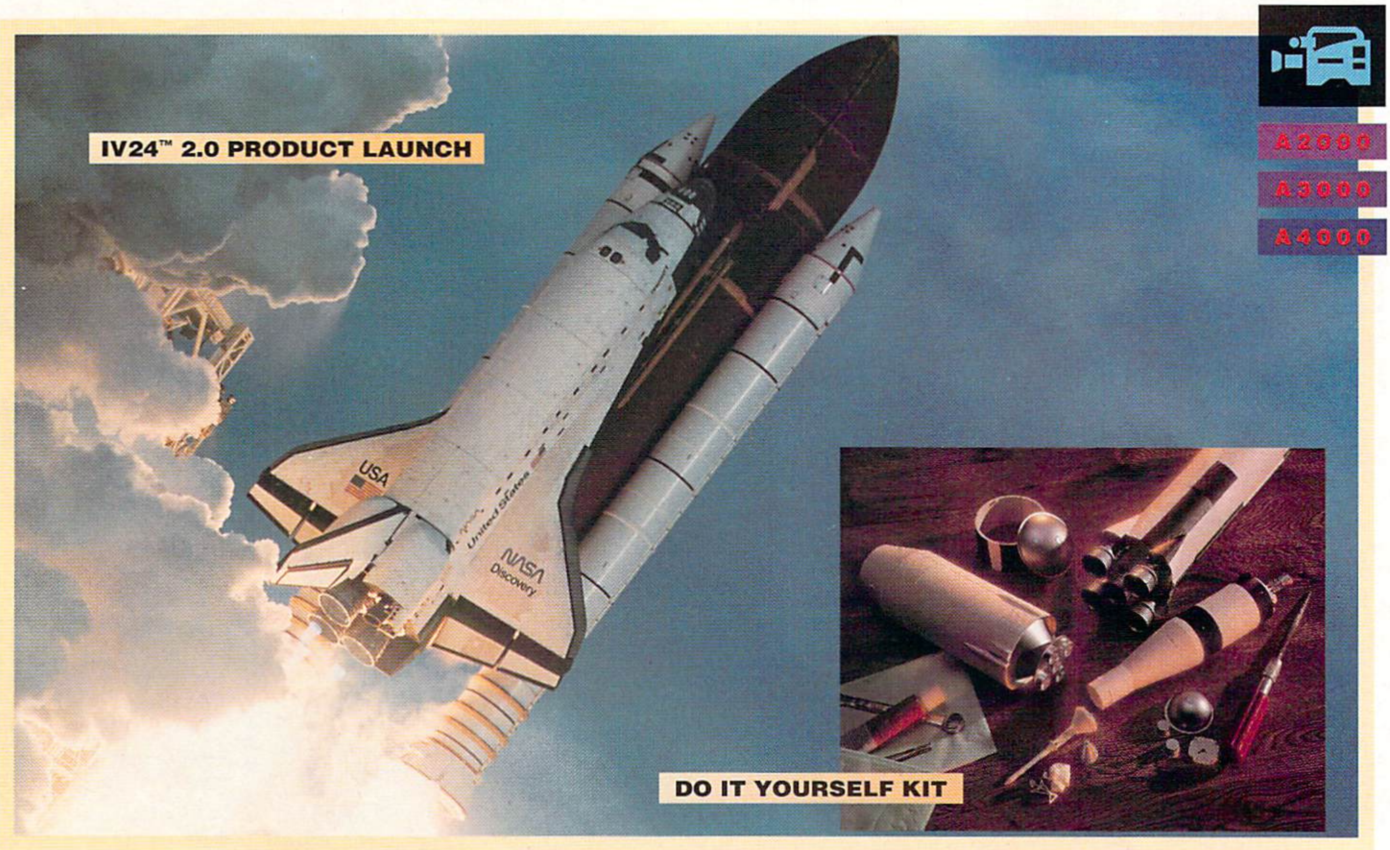


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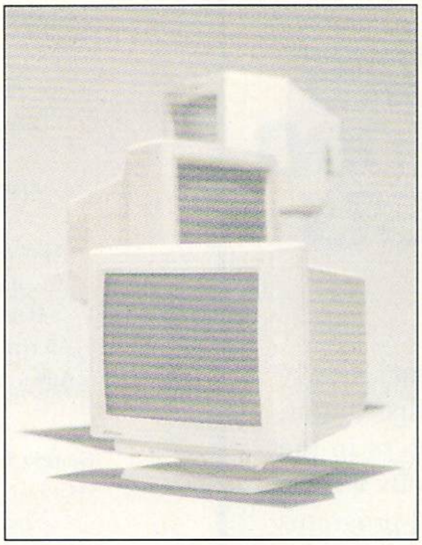
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VOLUME 9, NUMBER 6, JUNE 1993

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COLUMNS



Yes, our Annual Special Review Issue has roundups, buyer's guides, and reviews of everything from monitors (above), scanners, accelerators, and video gear to font sets, graphics programs, music software, and even the new Lemmings sequel. June is bustin' out all over with Amiga products galore!

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REVIEWS

GAMES

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EDITOR'S DRAWER

*A tip o' the hat to some broad-minded **AW** staffers who keep readers informed about what's good... and what's not.*

Reviews in Revue

Reviewers are the backbone of computer magazine publishing (next to editors-in-chief, that is). Most readers, eager to discover the latest products and updates for their systems, immediately turn to the review pages upon receiving their issues.

So, it should come as no surprise that since its early days, *AmigaWorld* has devoted the lion's share of its editorial in each issue to reviews. In a burst of originality, those first editors dubbed the section "Reviews," which provided a fresh look at the products that were being developed for the burgeoning Amiga market.

In this, our eighth year of publishing, *AmigaWorld* pays homage to those humble beginnings, while seizing the opportunity to incorporate several changes in the review process to ensure that reviews will remain an essential part of the fabric of the magazine.

First, we are pleased to announce that newly named Senior Editor Tim Walsh will manage the Reviews section in each issue. Tim, a nine-year veteran of the computer wars, has yet to encounter a piece of software or hardware that he couldn't tame. He will supervise an extensive network of qualified freelancers, who are itching to get their hands on the latest Amiga equipment.

Many readers and vendors will recall Tim in his roles as technical guru of *RUN* and *AmigaWorld*, as well as the driving force behind the successful special products division at both magazines. He now steps up to oversee *AW* reviews, and brings to the position a unique understanding of products in the Amiga market. Developers should send relevant information and products for review to Tim's attention.

Second, we've also taken steps to ensure that the entertainment side of reviews will be gamely covered. Games connoisseur Peter Olafson, who maintains a playful perspective at all times, will considerably expand his involvement in the magazine's game reviews.

Beginning with this issue, Peter adds a new feature to the Game Preserve column: a rating system that will tell readers at a glance whether or not the game merits their consideration. In addition, he's included key information—prominently displayed with each review—regarding compatible operating system(s), copy-protection, and hard-drive installability. This makes it easier for you to glean the information you need.

As long-time *AW* readers will attest, Peter, who has been a keen observer of the games market for many years, has had an influential voice in the magazine's games coverage in the past. His opinions, couched in a sharp-witted writing style, are well-read and well-respected throughout the industry.

In addition to these improvements in the regular review columns, it is appropriate to note the efforts of Senior Editor Barbara Gefvert in this, our annual Review Issue. Barbara has assembled an impressive array of feature reviews, roundups, and buyers' guides on a variety of essential items—including monitors for every kind of application, scanning devices and support software, and font collections for any video-titling job.

At this stage in the Amiga market, it is particularly relevant to rededicate ourselves to offering complete, unbiased, and timely reviews. Commodore has introduced its line of AGA machines, which solidly positions the computer manufacturer at the forefront of the graphics and video field. Third-party developers have followed with products and applications that take advantage of the machines' new capabilities. And we can anticipate that we'll see more new products based upon emerging technologies.

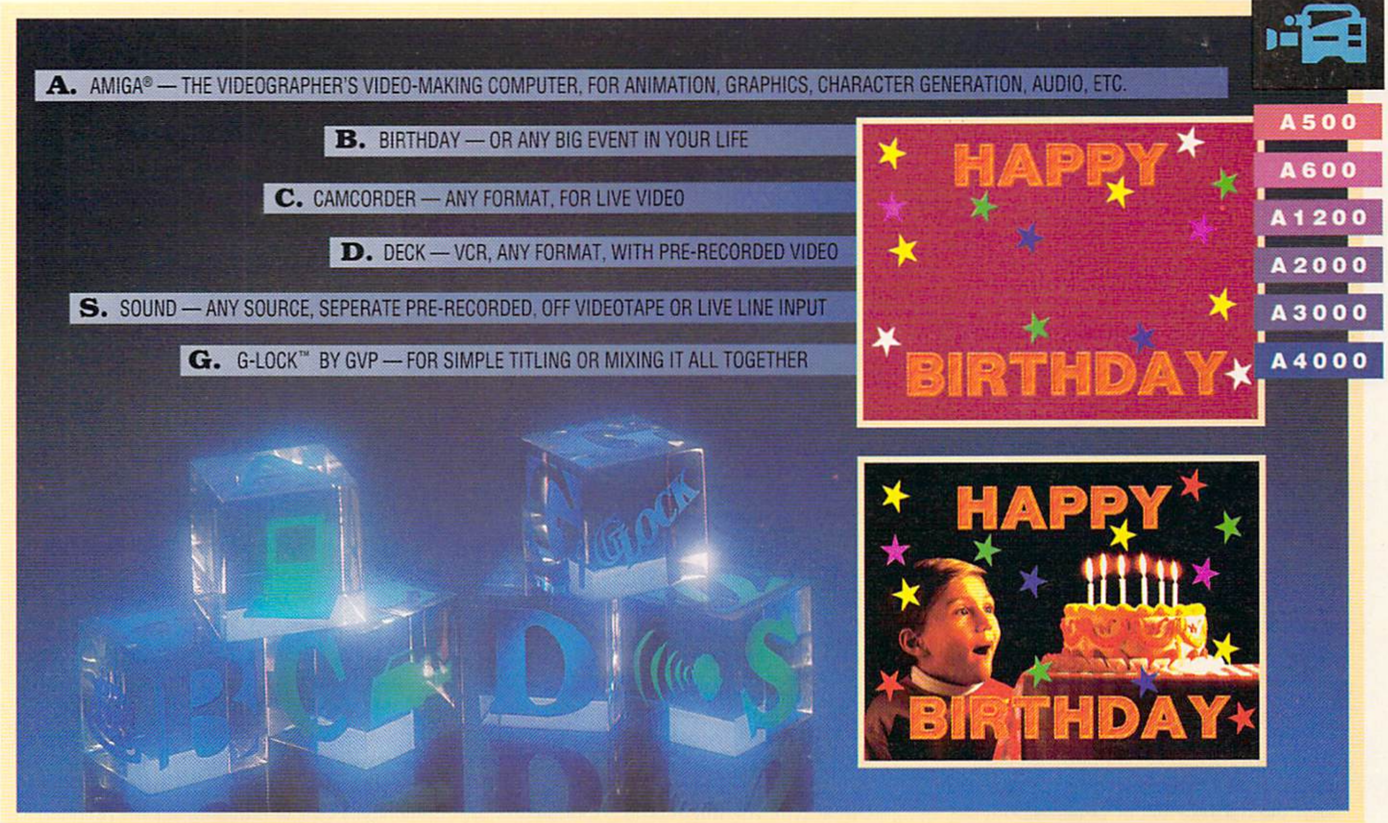
But innovation oftentimes breeds uncertainty. This "new generation of machines" has raised questions and confusion—about software applications, upgrade possibilities, compatibility with existing hardware, and new developments on the horizon.

AmigaWorld will address these concerns regarding current products, and monitor new developments in this industry. We feel confident that reviews will continue to rank highest in popularity among *AW* readers, and serve as a haven for weary Amiga travelers seeking reliable evaluations and truthful answers to their questions.

As always, the lines of communication are open here at *AmigaWorld*. We welcome your comments and suggestions regarding these changes or other industry-related topics.

Dennis Brisson

Dennis Brisson
Editor-in-Chief



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OVERSCAN

News, New Products and Networks

A1200 Star of WOCA Show

NEW YORK CITY—After a faltering start, Commodore feels confident that it has solved its AGA-production problems and is ready to meet demand. Support of the new Amigas—and of older models—was in evidence among both developers and users at the World of Commodore Amiga show in April.

CBM Spotlight

Commodore VP of Engineering Lew Eggebrecht kicked off the event with a keynote address full of details about development plans. Topping CBM's new-products list are lower- and higher-end Amiga 4000s (RS# 150). The former (**A4000/030**) is identical to the original A4000 except that a 68030 processor replaces the faster 68040, and its price tag is $2399. Meanwhile, the **A4000 Tower** (due for release around August) adds a SCSI-2 connector, and provides two video slots, five Zorro slots, three PC slots, six drive bays, and 250-watt power supply in an upright case.

A new **monitor** (see the editor's note at the end of "On Display," p. 30) and a **SCSI-2 hard-drive controller** board should be shipping when you read this. Later this year, you can expect a DSP (Digital Signal Processor) board with stereo codec (compression/decompression) via a 66 MHz AT&T 3210 chip; a family of double-speed multisession CD-ROM drives for the A1200, A3000/A2000, and A4000 (CBM is negotiating with Kodak for Photo-CD support); and a display enhancer that deinterlaces AGA video modes and provides screen promotion to 1280×1024 and scan-rate conversion to 72 Hz.

More CBM plans involve full-motion video and sound MPEG, plus software and possibly hardware players and an authoring system to support MPEG for title development. An impressive video-only MPEG "technology demonstration" seemed to be the biggest attention-getter at Commodore's booth.

Though it will be at least a year until we see results, Eggebrecht said chip-set development will take a bi-level approach, with one set addressing low-end needs and another for mid-to-high-level use. A primary goal in development of the "AGA-plus" chips, he said, is to maintain backward compatibility. The low-end chip set will retain the architecture of current Amigas, but provide improved video bandwidth and resolutions, up to 16MB programmable chip RAM, an optional "chunky pixel" mode (wherein information is at pixel, not bitplane, level), 16/24/32-bit color modes, and more.

The high-end chips will introduce a new architecture with on-demand DMA (letting ►

News About News

ASDG's **Art Department Professional** has broken new ground with version **2.3**, which reads and writes in the NewTek Video Toaster's framestore format. This allows direct framestore-to-D1 transfer capabilities via ADPro's ABEKAS digital video driver. ADPro 2.3 also provides a direct memory link to DeluxePaint IV AGA and OpalPaint. This link lets you load images—of any format ADPro supports—from within the paint software. There, you can manipulate them using both paint and ADPro tools, and then save them—again, in any format ADPro supports. (RS# 131.)

Thanks to a software update, **OpalVision** is fully compatible with the Amiga 4000 and its operating system. All the bundled software has been improved. The paint program, in particular, has many new features, including more drawing modes, overscan painting, on-line help, and ARexx implementation. Download the version-2 software from the OpalVision BBS (310/793-7142) or get the nine-disk set by mail from ***Centaur*** for $10; an extra $10 gets you revised manuals that reflect the changes. (RS# 130.)

In its latest incarnation, ***Electronic Arts'*** music-composition software has a shorter name: **DeluxeMusic**. The **2.0** version promises complete input, editing, and notation with multiple document support, Hide/Reveal Project options, improved MIDI support, definable macros, and ARexx linking. DMusic now provides a stand-alone player module and over 20 instruments with multiple play styles. Plus, you can attach any instrument sample or MIDI channel to an instrument name. The program allows printing of your work through a WYSIWYG screen display that allows 48 staves and repositioning of notes, chords, etc. (RS# 132.)

Digita International made a splash in the AGA pool with **Wordworth 2 AGA**. The updated word processor supports all new screen modes and graphics—including those in HAM8 format, and any created with DPaint 4.1 AGA—plus PCX files and shared palettes. Contact Digita for the £10 upgrade. (RS# 133.)

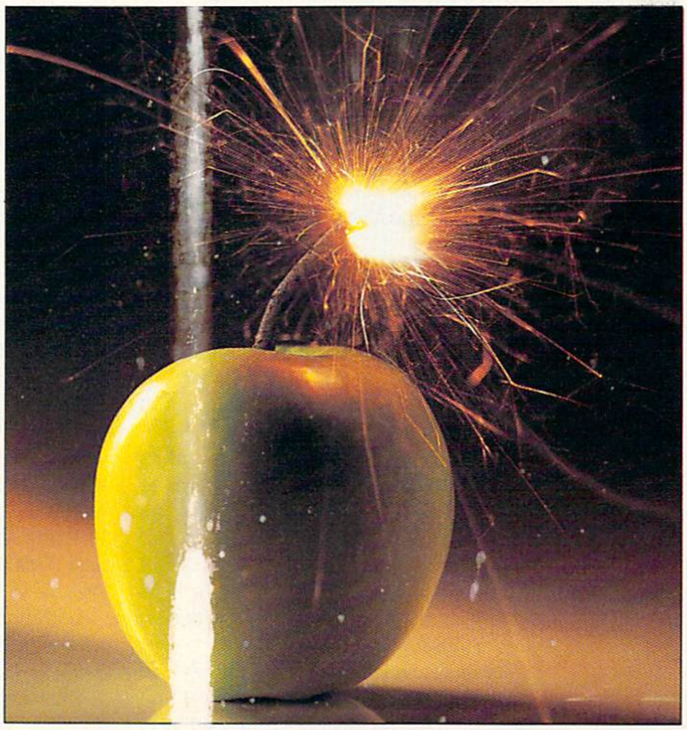
Aladdin 4D 2.1 promises speedier rendering, group levels, and a line-types attribute, plus support for AGA machines and files created with Art Expression (Soft-Logik). Simply send your registration card to ***Adspec*** to receive the free upgrade. (RS# 134.)

Real 3D has a new version—and a new North American distributor. The **Real 3D 2** ($699, Realsoft) animation, modeling, and rendering program offers particle animation, collision detection, inverse kinematics, skeletonal control, CSG and cubic b-spline objects. Other new features include a fully customizable editor, savable macros, open architecture, and hierarchical object construction. A ProDraw clip converter allows import of 2-D fonts and shapes. Contact ***Godfrey & Associates*** for details. (RS# 135.)

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 94.

SCALA

Everybody's talking multimedia revolution.
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A lot of apples were bruised when we first introduced Scala, the professional presentation package. With the new Scala MultiMedia MM200, they will be blown into oblivion!

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Scala LINGUA
The multimedia language Lingua with its close link to ARexx puts the advanced user in total control!

AnimLab
With this bonus program you can make your animations play up to four times faster!

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"...the best program in show business." *Amiga Format (UK)*

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The Scala main menu.



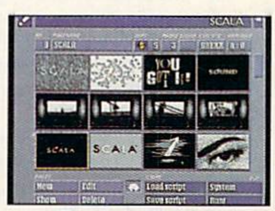
Scroll text by Scala.



The Scala edit menu.



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SCALA
Why make it harder?

Circle 60 on Reader Service card.

you specify bandwidth for individual tasks). Along with a performance increase of 12-20 times over ECS chips, the system promises compatibility with ECS. Also on the high-level list are DRAM and VRAM support, multiple blitters, 1K×1K screens to 72 Hz, and eight-channel 16-bit stereo sound.

Attendees asked Eggebrecht questions about the meaning of these announcements for currrent Amiga owners. In a nutshell, he answered that it's possible some current systems will be upgradable to AGA-plus, that NewTek *may* (hint!) be working on a Toaster for the A4000, that configuring pre-AGA machines to run the AGA chip set is probably cost prohibitive, and that there are no specific plans for an AGA CDTV.

A1200 Here We Come

Amiga 1200s and Centaur's OpalVision board—now with software version 2 (RS# 130)—were two of the hottest selling products at the show. But if there was a theme among third-party developers, it was A1200 expansion. ***MicroBotics*** may have been the first to develop for the A1200, with its **MBX 1200** math-chip/RAM board (RS# 152), but it was definitely not the last. ***GVP***, for instance, augmented its A1200 product line with the new **A1200 SCSI/RAM+**, a SCSI controller, RAM, and math coprocessor combo (see the review of GVP's A1230Turbo accelerator on p. 14). (RS# 153.) And ***DKB Software*** announced **DKB1202** ($189.95), featuring a math coprocessor, sockets for up to 8MB RAM, and a real-time clock (RS# 154).

From ***Elite MicroComputers*** come three A1200 products (RS# 155). The **Modular Expansion System** ($50) lets you fit not one but two expansion boards in the trap door of your A1200. The **2 to 3, IDE** ($50) lets your A1200 access two external hard drives. Meanwhile, both the **Power Box** (for the A1200, $175) and the **Back Pack** (A600 and A500, $110) accommodate additional SCSI and IDE drives—and provide power supplies.

CSA added to its product arsenal the new **TwelveGauge** ($699), a 50 MHz 68030-accelerator and SCSI-interface board with room for 32MB of RAM and a 68882 math coprocessor (RS# 156). Similarly, ***ICD's*** new **Viper 1230** (from $499) offers an '030 accelerator, battery-backed clock, sockets for a math coprocessor and up to 32MB RAM. It also has a DMA port that accommodates a plug-in card (**Viper S2**, $199) with internal and external SCSI-2 connectors. ICD also showed its **Trifecta 500** and **2000** units—combination IDE, SCSI, and RAM expanders for the A500 and A2000, respectively. (RS# 157.)

Other Business

Scala showed off **MM210**, an upgrade to its popular presentation package. *AmigaWorld* erroneously reported that the earlier MM200 worked with the AGA chip set, but this upgrade, with its improved wipes and scripts, truly does (RS# 158).

GVP demonstrated the **2.0** version of its **IV24** graphics board, which now comes with full-featured Caligari 24 3-D software, plus a redesigned MacroPaint, and MyLad and Desktop Darkroom programs. GVP's **DSS-8** eight-bit sound sampling hardware now comes in a clear-plastic case along with new software (RS# 153).

Across the way, ***Microdeal*** (RS# 159) made sound waves with **Clarity-16**, a 16-bit sound sampler for just $249.95, and with **Videomaster**, a sound-and-video digitizer. Meanwhile, ***Electric Theatre*** played up its delightful **Keys to Music**, an interactive program that teaches both music theory and performance (RS# 160).

Migraph's new **ColorBurst Color Hand Scanner** ($549) drew a crowd (RS# 161). So did ***Utilities Unlimited***, with demos of its **Emplant** board, which promises to run Mac, PC, and Atari software with the insertion of the proper ROM chips (RS# 162).

Soft-Logik showcased its new **TypeSmith** font editor and previewed the upcoming **3.0** release of its **PageStream** DTP program, which will support AGA colors and gradient fills as well as ARexx. (RS# 163.)

AGA support was also in evidence at the ***Gold Disk*** booth, which featured the latest versions of its publishing programs, **Professional Page** and **Pagesetter 3**. Gold Disk demonstrated AGA support on its **Professional Calc 2** spreadsheet and **Video Director** VCR-hookup as well. (RS# 164.)

Moonlighter Software introduced a companion to its Ami-Back disk-backup program: **Ami-Back Tools** provides disk recovery and optimization utilities, and more (RS# 165).

What's It All Mean?

While small by industry standards, the New York show attracted an enthusiastic crowd and provided a convenient platform for companies to demonstrate Amiga support. This market continues to prove its resiliency with dedicated users and developers.

Commodore, meanwhile, seems bent on attracting new buyers. In fact, CBM hinted that it will make even more announcements at the National Association of Broadcasters show in Las Vegas. Check out next month's issue for that report! ***—DB and BG***



ON-LINE SCAN

By Tim Walsh

While AGA-specific files have materialized on the networks more slowly than I had anticipated (see the Jan. '93 On-line Scan), I have discovered a wonderful compatibility of AmigaDOS 2.0-specific programs under 3.0.

Enhancing the Workbench and operating system of your A1200 or A4000 requires a creative mix of a half dozen 3.0 programs and a couple of 2.0 programs—all of which are available on line. A quick search of AGA, A1200, and A4000 files on BIX, CompuServe, GEnie, and Portal yields virtually all of the programs that follow. And installation rarely requires more than dropping a program's icon into the 3.0 WBStartup drawer.

One program for AGA owners with ample RAM is MPEG Player, which lets you play JPEG animations under 3.0. As of this writing, no other program can deliver photographic-quality animations quite like MPEG Player—without extra hardware.

A lesser utility called New Look Menus gives 3.0-Workbench and -applications drop-down menus a serious, professional appearance. Similarly, the latest version of Exploding Layers (often called "Exploding Windows") gives a dynamic look that no other single utility can match. Serving duty on many non-AGA Amigas, it works like a charm under 3.0.

NewPop 4.0 AGA, an update of the beloved time, date and other-information keeper, takes advantage of the AGA chip set. PKludge is another 3.0-specific utility. A mode-promotion program that automatically resizes your screen as needed, it is a must for A1200 and A4000 users.

ViewTek, which works nicely under 2.0, is a mandatory item for 3.0. Currently at version 1.04, this small graphics viewer displays most common formats and plays animations. Installed as a tool using Tools Manager under 3.0, it can save significant time reviewing graphics in a hurry.

Finally, the 3.0-specific Window Blender creates a resizable window on a custom or Workbench screen with up to 256 colors. It seems to have little or no purpose beyond creating windows of blending, cycling colors and user-defined Mandelbrots, but its download numbers suggest that it's the reigning champ of eye candy.

Before I sign off: Last month's On-line Scan mentioned that you could access *AmigaWorld's* area on Portal with the command GO AMIGA;3;1. The addition of another vendor in the same area requires that you type GO AMIGA;3;2 instead to enter the *AmigaWorld* forum. □

OBJECTS d'ART

If you can't own the car of your dreams, at least you can drive it through an Imagine or LightWave animation.

Exotic Cars Volumes I and II ($34.95 each, ***AmiGrafix)*** each features one high-performance speedster, plus bump and image maps for tires,instrumentation, and license plates; less-detailed objects for low-memory use; and full articulation. Depending on which 3-D package you specify, you'll also get special features designed to take advantage of that particular program. (RS# 121.)

Cyclemuscles ($99, ***Spectronics)*** gives you gain without pain: two detailed bodybuilder caricatures in 24-bit and HAM versions for use in Imagine. Running and walking cycles are included to get those muscles moving. (RS# 126.)



Cyclemuscles can give your Imagine scenes a lift.

SHADOW BOX

Need more expansion options than your Amiga 500 allows? The **Eagle Shuttle Board** ($799, ***Spectronics***) connects to the A500 to provide A2000-like possibilities. The black tower-style case offers a processor slot to accommodate your Amiga's motherboard; a video slot and PC slots; four drive bays for mounting hard, floppy, and removable-media drives; and a 220-watt power supply for running it all. A separate case is provided to house your Amiga's keyboard.

Spectronics is promising another version later this year for those seeking similar options on the Amiga 600. (RS# 129.)

HEBREW 101

MA-PITOM Software's new interactive learning program **MASPEAK-Jr.** ($99) actually speaks Hebrew. The synthesized voice is adjustable in pitch and volume and has three default settings. With the help of four talking characters, this program aims to teach Hebrew with a directory of over 700 files of traditional and modern prayers and songs. If that is not enough, you can create your own texts by clicking letters with the keyboard or the mouse while using the software's Hebrew Keyboard Map.

Other features include the pronunciation of accents such as Israeli and Sephardic Hebrew and a letter-identification mode that explains a letter's sound and use. The program requires AmigaDOS 1.3–2.04, 1MB RAM, and a Workbench 1.3 system floppy disk. (RS# 120.)



OVERHEARD

ShowBiz Expo West expects to attract some 500 exhibitors (and many more video enthusiasts) to the Los Angeles Convention Center June 5-7 for its tenth-anniversary event. Call 213/669-1811 for details.

SEEING IS BELIEVING

MacroSystemUS's new **Retina** can be the instrument of vision for your A2000, A3000, or A4000. The card comes in 2MB ($599) and 4MB ($699) RAM configurations (the latter allows double-buffering). Because it does not require the video slot, Retina is compatible with NewTek's Video Toaster and Centaur's OpalVision. It can create a 16.8 million-color 800×600 noninterlaced display—and can take 65,000 of those colors to create a 1024×768 noninterlaced display, or 256 to display at 1280×1024 interlaced resolution. Retina lets you display Workbench at up to 1900×1426, depending on your monitor. (The board's DB-15 VGA connector and analog RGB output make it compatible with 1084, 1950, VGA, and better monitors.) What's more, Retina can display 24-bit images while emulating Workbench, and any programs that open on Workbench (plus some that don't) can run at Retina resolutions. Finally, the board comes with VDPaint 24-bit real-time paint software, and it supports MacroSystemUS's VLab for 24-bit video digitizing. (RS# 125.)

Picasso, from German developer ***VillageTronic***, also promises increased color and pixel resolution for Amiga 2000, 3000, and 4000 owners. The Zorro II board promises to increase graphics performance significantly, even on an A4000. It offers several display options: a 24-bit (16.8-million-color) 640×480 display; 16-bit (65,536 colors) in up to 800×600; plus an 8-bit packed-pixel mode (256 colors out of 256,000, up to 1280×1024) and normal planar modes with 2 to 16 colors. In conjunction with its Intuition driver, you can use the Picasso display as a replacement for the Amiga's native display. The driver runs under AmigaDOS 2.x and 3.0 and promises compatibility with all "clean" 2.0-supporting software. The board comes with 2MB display memory for linear or 64K-segment use. (RS# 124.)

Harlequin Plus (***Amiga Centre Scotland***) offers everything the original Harlequin framebuffer does—and more. A full-screen four-bit overlay (16 colors from a 16.8-million-color palette) works independently of the main 24-bit display to give you 32-bit color resolution. You can now feed the Harlequin's standard output through a 24-bit color lookup table to facilitate real-time gamma correction, color cycling, or color transformation. Among the board's modes are true-color 15- and 8-bit modes (for 32,768 and 256 colors, respectively). There's also a pseudo-color 8-bit mode (256 colors from a 16.8 million palette) with color cycling, in which the board can hold up to six full-screen images simultaneously, ready for instant display. Both the NTSC and PAL models offer several revised square-pixel screen resolutions. A 4MB linear memory map is standard, as is a built-in genlock, and broadcast-standard output sync and signal levels.(RS# 123.)

German developer ***X-Pert*** hopes to make magic on your system with its modular **Merlin** board (distributed by ***Spectronics***). Providing resolutions up to 1280×1024 noninterlaced, the board fits into a Zorro II or Zorro III slot, providing compatibility with the A2000, A3000, and A4000. It features composite, Y/C, and 15-pin Sub-D output, and allows up to 4MB RAM (the 1MB configuration is priced at $699; with 4MB it's $999). The board comes bundled with a real-time Workbench emulator that supports the A4000's AGA chip set, and TV-Paint Junior, a 24-bit drawing program. Two extension modules ($699 each) will plug onto the board to provide 24-bit digitizing (NTSC and PAL; 25/30 frames per second) and genlocking (video/computer-graphics overlay). (RS# 127.)

OpalVision

24-bit Video and Graphics System

The OpalVision™ 2.0 Main Board

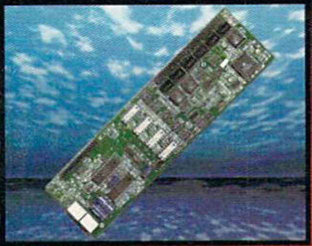
A true 24-Bit frame buffer and display device with 16.8 million colors available for every pixel and a maximum resolution of 768 x 480 (580 PAL). An internal card, it operates automatically in NTSC or PAL mode in any Amiga computer with a video slot (including the Amiga 4000). It's powerful VLSI graphics coprocessor enables stencil modes, a host of transition effects and smooth, hardware-controlled priority switching and scrolling/panning effects. The board's state-of-the-art design allows smooth fading of pictures, color-cycling effects, and smooth, double-buffered 24-Bit animation. Includes critically acclaimed and award winning OpalPaint™, Opal Presents™ and OpalAnimMATE™ software.



New incredibly low price ... $699

The Best is now even *more* affordable!

OpalVision Video Processor™



Plug this card into the OpalVision Main Board and add a wealth of additional features and functionality. It's a high-quality, real-time 24-Bit framegrabber which doesn't require a time-base corrector. And, it's a professional-quality genlocker with chroma and luma keying. The 256-level linear transparency key allows the definition of transparency between two live video sources on a pixel-by-pixel basis for smooth vignettes, anti-aliased text and super-smooth effects. The Video Sandwich key allows you to insert chroma or luma keyed video between definable foreground and background layers of a 24-Bit image. It also provides real-time color processing of live video and an unlimited number of transitions and Digital Video Effects using the included OpalVision Roaster Chip and software. These include cuts, wipes, fades, and special organic effects (soft- or hard-edged), plus an infinite range of flips, tumbles, picture-in-picture, page peels and image wrapping.

OpalVision Video Suite™

A power-packed video and audio mixing, switching, and transcoding device. This 19-inch, rack mountable unit is so advanced that it has its own internal computer and every aspect is software-controlled for precisely timed and accurate functionality. The Video Suite includes a wealth of inputs and outputs. There are 9 video and 10 audio inputs available, plus the 24-bit frame store. Professional quality video inputs and outputs are available simultaneously in RGB or Y/R-Y/B-Y, Composite and S-Video. Choose any 2 sources from these inputs, assign a transition or special effect, and then trigger it manually or automatically. All of the transitions and effects provided by the OpalVision Video Processor are available for use by the Video Suite.



Video Performance

Video Input Standards (User selectable):	NTSC, NTSC 4.4, PAL, SECAM
Video Output Standards:	NTSC, NTSC 4.4, PAL
RGB output Bandwidth	>7 MHz
Composite (Luma) Bandwidth	4.5 MHz typical
S-Video Bandwidth	5.5 MHz typical
Hue Control	+30 to -30 degrees
Video lock jitter	<15ns
Horizontal position adjust	-320 to +1000 ns
Horizontal lock range	+/- 1200Hz typical
Subcarrier lock range	+/- 350Hz minimum
Linear Keyer input speed	>7 MHz

Audio Performance

Audio Inputs	10 inputs (5 left, 5 right) line level 20k ohms
Audio Outputs	2 outputs (Left, Right) line level 70 ohms
Input Mode	Differential for very low noise
Frequency Response	20Hz - >20kHz
Frequency Equalization points	59 Hz, 205 Hz, 790 Hz, 2.95 kHz, 12 kHz
Equalization Range	+/- 15db
Total Harmonic Distortion	0.05 % typical
Mixing level control	0 to -70db (independent software controlled DAC's)
VU meters	10 steps -20db to +3db range

Save $600 on a complete OpalVision Video System!

Buy an OpalVision Main Board prior to June 30, 1993 and receive coupons worth $600 off the Suggested List Price of the Video Processor and Video Suite. Proof of Purchase required. Call Centaur for complete details.

Circle 162 on Reader Service card.

REVIE

Accelerator combo board for the Amiga 1200.

GVP A1230 Turbo+ Accelerator

Great Valley Products, **$699.**
Hard-drive installable.

System Requirements: A1200
Installation: Easy

Which Amiga model has six megabytes of RAM, comes with AmigaDOS 3.0, has full AGA graphics support, is faster than an A3000, and costs way under $2000? While the description almost matches an Amiga 4000, the price of that particular dream machine is over $2500. With the new A1230 Turbo+ accelerator from GVP, however, you can catapult the lowly Amiga 1200 to near-4000 levels of performance and expandability for almost $1000 less than the cost of a 4000.

The A1230 accelerator board provides a 68EC030 processor running at 40 MHz, about one-and-a-half times as fast as the processor on the Amiga 3000. A major difference between this processor and that of the 3000 is that the EC '030 does not have a built-in Memory Management Unit (MMU). Normally, an MMU is used to remap the Kickstart ROM to 32-bit RAM, but the A1230 contains hardware that allows it to perform this task without an MMU.

This board cannot, however, perform other functions made possible by an MMU, such as running the Unix operating system, utilizing the memory-management features of the A-Max Macintosh emulator, and using the Enforcer (a programmer's tool) or virtual-memory programs like GigaMem that allow you to use parts of your hard drive as extra memory. Moreover, the board uses a surface-mount processor, so you cannot simply substitute a full 68030 for the EC part. GVP has indicated that it may make a model available with a full 68030 if demand is sufficient, but since most of the functions requiring an MMU are pretty esoteric, most users will not notice the difference.

SIMMply RAM

The A1230 also includes a socket for a 68882 math coprocessor and two SIMM sockets for 32-bit expansion memory. The memory sockets can accommodate only GVP's proprietary SIMMs, which the company sells in one-megabyte, four-megabyte, and sixteen-megabyte sizes (the same modules used in its 68030 and 68040 accelerators for the A2000). You can use SIMMs of two different sizes in the same board, however, so it is possible to come up with the various configurations of 1, 2, 4, 5, 8, 16, 17, 20, or 32MB.

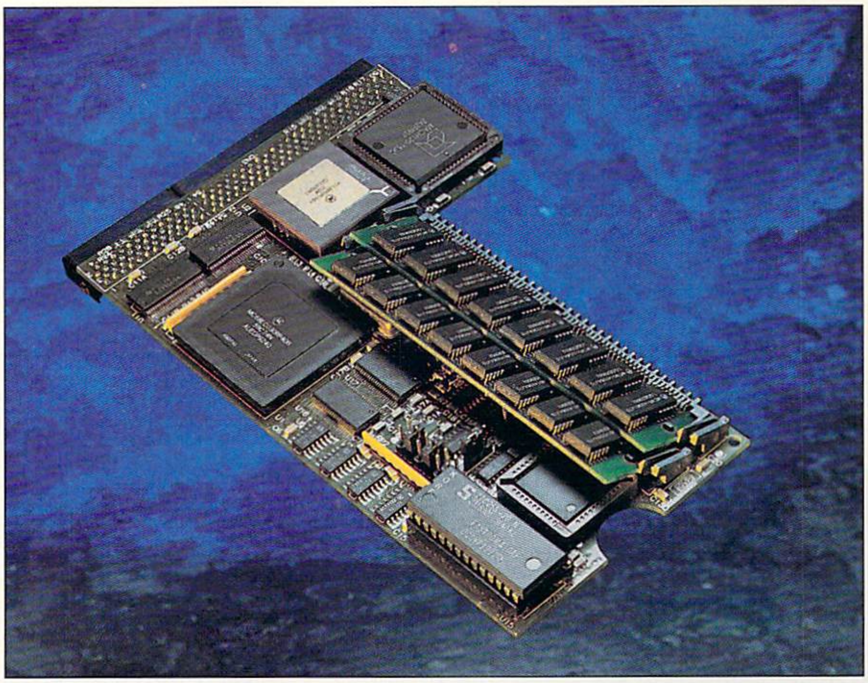
GVP has indicated that its initial plan is to sell this board with a 68882 math coprocessor and a single 4MB SIMM. You will, of course, be able to add more memory just by plugging in another SIMM module (and setting one jumper if you add a 16MB module). Because the 16MB SIMMs are currently pretty rare and expensive, the most popular memory configurations for the A1230 will probably be 4 and 8MB, at least for a while. My review unit actually had one 4MB and one 16MB SIMM, providing 20MB of fast RAM to go along with the standard 2MB of chip RAM. This total of 22MB is four more than you can fit on the motherboard of an Amiga 4000!

The A1230 comes on a plug-in board that fits into the internal expansion slot of the Amiga 1200. Because this slot is covered by a plastic hatch, you don't need to disassemble the computer for installation. All you do is pry off the cover with a coin, insert the board, and snap the cover back on. This is easier said than done, however. Commodore didn't provide a whole lot of room for the expansion slot, and GVP's board needs every bit of that space, so it's a tight maneuver. (Removing the board is actually harder than plugging it in—I had to push the edge of the connector with pliers as I pulled the board.) Still, the installation is much easier than taking the machine apart and putting it back together again. Even allowing for a brief struggle, the whole process took only about two minutes.

After the A1230 is in place, you can start using it immediately, without having to install any software. GVP does, however, provide some utility

To locate the vendors of the products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 94.

W S



software on a floppy disk to help you take maximum advantage of the board. The disk includes Commodore's standard hard-drive installation program, which makes it easy to move the software to the appropriate place on the drive if you so desire.

Tools of the Trade

The three main programs that come with the board are GVPCpuCtrl, MemTest and GVPInfo. GVPCpuCtrl is the program that allows you to move the Kickstart image into 32-bit RAM. It does not, however, let you bypass the accelerator board as it does with other GVP accelerators. (There is a hardware jumper available if you need to install an "on/off" switch for some reason.) The MemTest program checks the system's memory, which is helpful when installing an additional SIMM. Finally, the GVPInfo program provides information about your system's memory, drives, custom chips, and expansion boards.

Adding the A1230 Turbo+ board dramatically increases the speed of the 1200. HAM8 animations that played back slowly on a stock system played at full speed after I added the accelerator. Tests with AIBB 5.5, a commonly used benchmarking program, show that the Amiga 1200 with the A1230 installed is more than three times as fast as an unexpanded 1200, and more than twice as fast as a 1200 with 32-bit fast RAM and a 14 Mhz 68882 math coprocessor (see Table 1).

It may be surprising, but the figures in Table 1 showing that the 1200 with the PCMCIA memory card was *slower* than an unexpanded 1200 are no mistake. The PCMCIA interface may be fine for devices like modems and network adapters, but it creates such a bottleneck that it is clearly *not* the way to go when expanding your memory on the 1200. Finally, when compared to Commodore's other 32-bit machines, our Turbo 1200 was about 1.5 times as fast as the A3000, and not all that much slower than the A4000.

GVP should be commended not only for the technical feat of cramming so much power onto such a little board, but for coming out with this product almost as soon as the A1200 became widely available. The 1200 is an impressive machine to begin with, but with the 1230 board, it is nothing less than astonishing. For about the same price as an A3000 close-out, and in a package not much bigger than the 3000's keyboard, you can have a system with more processing power, more memory capacity, and far better graphics than the 3000. The availability of the A1230 should go a long way towards convincing potential buyers that the low-priced 1200 is really a powerful and expandable computer.

—*Sheldon Leemon*

GVP's A1230 Turbo+ Accelerator can make your A1200 perform like an A4000—for about $1000 less than the cost of an A4000!

Table 1: AIBB Version 5.5 Results

System	Integer	Graphics	Floating Point
1200 PCMCIA DRAM card	4.34	1.6	11.57
1200 No Fast RAM	3.64	1.48	7.27
1200 Fast RAM + 68882	2.51	1.26	2.36
3000 25 MHz 68030	1.57	2.54	1.58
4000 25 MHz 68040	0.78	1.07	0.54

***Note*: The values indicate the speed of the A1200 with the A1230 installed as compared to the other listed systems. For example, it is 1.57 times as fast as an A3000 at integer operations, but only about three-fourths as fast as an A4000.**

Major update of multifeatured music software.

Bars&Pipes Professional 2.0

Blue Ribbon Soundworks, $429

All models. Not copy protected.

Minimum system: 2MB Hard drive recommended.

A deep satisfaction of reviewing Amiga software is watching programs evolve and mature. It is my pleasure to report that Bars&Pipes Professional has come of age. Already a full-featured composition and scoring tool, the release of this major upgrade makes it the control center for all sorts of multimedia applications. These include video scoring and editing, animation and graphics presentation, and devices such as the Video Toaster, IV-24, G-Lock, and SuperGen.

Music for the Masses

A multitude of improvements speed up the workings of Bars&Pipes Professional 2.0. All graphical display and editing features have been honed, seemingly to perfection: Windows scroll, resize, and update with dead-on accuracy and speed; the interface design has the amazing Workbench 2.0+ look and feel; score output (printing) is considerably improved and tuned up; the song-construction window, through which global editing and arranging tasks are performed simultaneously across multiple tracks, is vastly improved, as are the section, track, and list-editing functions.

A lot of the good news has to do with B&P Pro's Tools, the program's unique method of doing almost everything, including input, output, transposing, creating harmony and counterpoint, and making articulations and arpeggios,



Multimedia producers will love Bars & Pipes Pro 2.0's Media Madness module.

patch assignments, and looping and pattern passages. Many of the new tools belong to the Media Madness control set, and are discussed below.

Other new tools include Tempo Tap (receives tapped notes and creates an overall tempo map), Pattern (graphics-based pattern recording, editing, and playback—an alternative to linear track-based recording), ARexx Real Time In (converts ARexx messages into MIDI notes and feeds them into a track), and Pedal Meddler (simulates the three traditional piano pedals). You can now organize Tools into as many as eight Tool Trays for each song, with the arrangements and parameters of each tool saved along with the song.

A number of new and revamped Accessories also complement B&P Pro 2.0. These external programs, configured to work within the B&P Pro environment, include MMC (MIDI Machine Control), MTC (MIDI Time Code synchronization), AmiLink (controls the AmiLink video-editing and machine-control software via ARexx), PIP (controls the IV-24 picture-in-picture function), SyncPro (controls Blue Ribbon's

SMPTE sync box), SMoose and sMerFF (file converters for SMUS and MIDI formats), and SunMPTE and SunSet (control and allow access to SunRize's Studio 16 software). Owners of SuperJam! or the One-Stop Music Shop will find Accessories that provide integration into the composing environment.

Integration is the key word here. Every production task—from the simplest theme-music score to a complex video edit involving animations, synchronized music, sound effects, and dialog—demands its own particular means and methods. Every producer has a unique style and preferred way of working. One of the marvels of B&P Pro's design is its flexibility: There are always several ways to perform any task, and several levels of complexity and control. This means all functions are available to users at all levels of experience; it also means it is as easy to edit and arrange at the micro level as at the macro.

Coordination Madness

One of the challenges of multimedia production is that several different events must often occur at the same time. In the past, since most of us are endowed with only two hands, this has been an almost insurmountable problem, compounded by the fact that programs weren't designed to work together or even simultaneously. The Media Madness Tool Set changes all that. These new enhancements allow for a wide range of simultaneous and synchronized media events. Wow!

Media Madness works by assigning events to particular MIDI notes on a track, with each tool or controlled application having its own track. These triggers, or hits, are recorded into the song format, allowing precise timing internally and externally. One tool, The Last Slide Show, shows IFF pictures on demand; ANIMal plays animations; Command Performance sends commands to an ARexx port, a file, or a device (printer, serial, parallel); SunRize Out and SunRize Virtual Track control and trigger sample playback from either the 12- or 16-bit version of the board; Toasty provides a graphical representation of the Video Toaster's Switcher interface and a means for compiling ARexx scripts for all Switcher functions.

Additional Media Madness tools can control GVP's G-Lock genlock and IV-24 display board, Digital Creations' SuperGen genlock, Scala (multimedia presentation program), Pioneer Optical laserdisc player, MediaPhile video-edit controller, and the Amiga's internal speech and eight-bit sound routines.

As of this writing, I have been working with the new version for only two weeks, and have put it to strenuous use in a video-editing project that has inundated me. For the introduction to each of four tapes in a series, I had to create, transfer to video, and score a complex series of still frames, animations, and moving video. The audio tracks are a mix of narration, sound effects, and music. Normally, this would have taken multiple video edits, two additional audio inserts, as well as careful mixdown, times four. By automating much of the procedure with B&P Pro's facilities, I cut production time for these segments at least in half, a quite respectable profit margin.

The above is by no means an exhaustive list of features and capabilities. I keep feeling that I should have some constructive suggestions for improving the program or adding features, but I have been so busy exploring and working with what is present that I am unable to generate a wish list. Bars&Pipes Professional has definitely come of age—mature, but by no means old.

—Michael Hanish ►

Provides Y/C input/output for theVideo Toaster.

Y/C Plus

Y/C Plus, Inc., $949

2.0 compatible.
Accelerator compatible.
Installation: Easy.

Minimum system: A3000, Video Toaster.

Owners of Super-VHS or Hi8 format video equipment who plan to buy a Video Toaster are often disappointed when they discover that the Toaster uses only composite signals, and not the separated video signals that their equipment is able to produce. Some of this concern is misplaced; you get the enhanced resolution of Super-VHS (about 400 lines as opposed to about 240 for regular VHS) regardless of whether you use a composite or separated signal.

The real benefit of separating the luminance (the brightness or Y component) signal from the chrominance (the color or C component) comes in the form of reduced color bleeding and dot crawl in areas of high color saturation. These improvements, while perhaps not as significant as the increased resolution afforded by S-VHS and Hi8, are nothing to sneer at. Maybe that is why one of the most-requested additions to the Toaster is Y/C input and output capability.

Separate Plans

While NewTtek hasn't announced any plans to offer a Y/C version of the Toaster, Y/C Plus, Inc. has come out with the next best thing. Its Y/C Plus board takes the incoming Y/C signal from your separated composite-video equipment, encodes it to composite, sends it through the Toaster, and then decodes the signal from the Toaster back to Y/C.

The way it works is simple. There are six mini-DIN (S-Video) connectors on the rear bracket of the Y/C Plus board, four for Toaster inputs 1–4 and two for "Program Out." Each input channel has a jumper that allows you to select input via the standard composite Toaster connection or through the Y/C Plus. For the channels that are set to Y/C input, the normal Toaster inputs are converted to composite outputs, which provides another source for monitoring these inputs.

There is no Y/C output for Preview, but since you don't normally record that channel, you should be able to make do with the standard composite output. In addition to the Y/C outputs, the Toaster's normal composite output is still active. This output is terminated, however, which means you should not use it with devices like monitors and VCRs that are themselves terminated. The Y/C Plus manual suggests that you might use a video-distribution amplifier to isolate this terminated line when employing terminated devices.

Installation of the Y/C Plus takes only a few minutes. The board plugs into the standard Amiga expansion slot that is closest to the power supply. It connects to the Toaster via a couple of ribbon cables that run from headers at the top of the Y/C Plus board to headers along the top of the Toaster board. After plugging in the board and configuring the jumpers for the desired combination of inputs, enable termination in the Toaster Preferences screen for every S-Video input. There is no software control of any of the Y/C Plus functions.

Many video peripherals such as TBC (time-base corrector) cards plug into the Amiga's IBM slots, so there is no conflict

between them and the Y/C Plus. There is a conflict, however, between the Y/C Plus and PreVue Technologies' Breadboard, which provides a composite "key out" and delay lines for timing the Toaster into an existing switcher. Both of the boards plug into header JP-2 on the Toaster.

While you might use the Breadboard with Y/C Plus by fabricating a "Y" cable, this isn't too feasible a scenario. The Breadboard provides a 400-ns delay to compensate for the normal Toaster delay, but the Y/C Plus introduces an additional 1360-ns delay, which is beyond the range of the delay lines on the Breadboard. If you're planning to time a Y/C Plus Toaster into an existing switcher, you'll need to find another way to compensate for this total 1760-ns delay. According to Y/C Plus, Inc., however, the board will work in a 3000 system in which a Toaster Cozzy is used.

TESTING, 1, 2, 3 . . .

To test the Y/C Plus, I installed it in a Toaster edit system consisting of two Panasonic AG-7650 S-VHS players and a 7750 S-VHS recorder. In operation, the Y/C Plus lived up to its claims of reduced color artifacts and dot crawl. The difference was particularly noticeable when using one of the framebuffers to view Toaster graphics, such as the Toaster logo that appears when you first boot up, or titles from the character generator. The reduction in color smearing did, as advertised, make vertical and horizontal lines appear sharper.

The manual states that using a TBC with Y/C inputs and outputs will increase picture quality, but we saw no difference between feeding the Y/C Plus from the Y/C or composite output of the decks—the degree of improvement appeared to be the same in each case. It appears, therefore, that if you use a TBC that does a good job of encoding the original separated video to composite, you will not lose any of the benefits that result from the Y/C Plus decoding the Toaster's output to separated video.

You will have to decide, of course, whether picture improvements that the Y/C Plus provides are sufficient to justify its price tag. Although these improvements are incremental rather than night-and-day, professional video producers seeking to improve the quality of their product are likely to find it well worth the price. Don't, however, expect this board to make up for poor editing equipment. If the Y/C Plus costs more than your edit decks, you will probably be better served spending the money on upgrading your basic gear.

—Sheldon Leemon

A3000 expansion box for the Video Toaster.

TOASTER COZZY

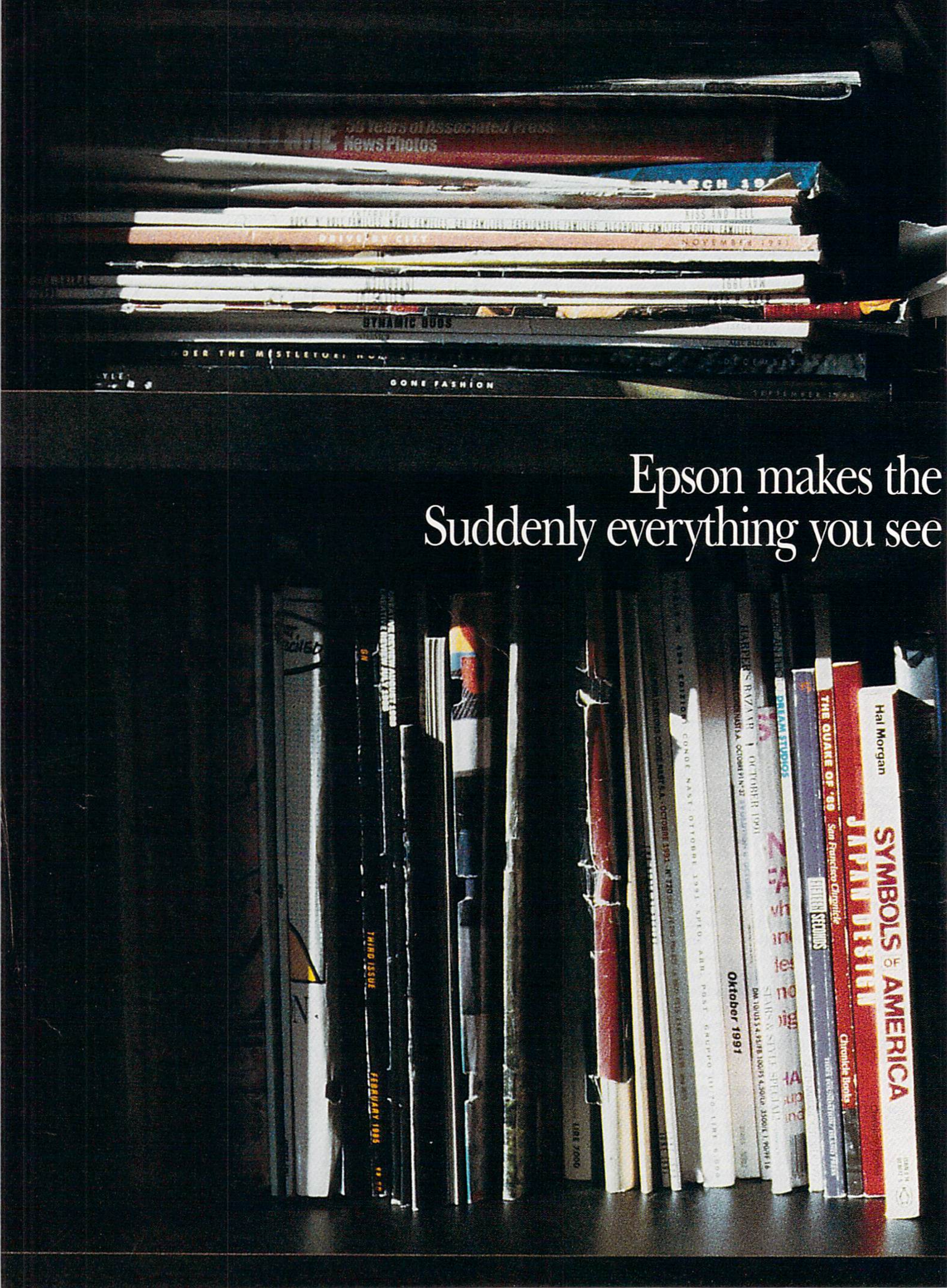
***Heifner Communications*, $635**

2.0 compatible.
Accelerator compatible.
Installation: Easy.

Minimum system: A3000, Video Toaster.

My, how time flies. Incredibly, the sluggish Amiga 2500 was king of the hill when the Video Toaster was designed, but by the time the board made it to market, Commodore had already released the A3000. The 3000 seemed like the ideal system for the Video Toaster, thanks to its built-in display enhancer and fast 68030 processor.

Unfortunately, there were two obstacles to putting the Toaster in a 3000. *Continued on p.22.*


Epson makes the
Suddenly everything you see
News Photos
DYNAMIC DUOS
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THIRD ISSUE
FEBRUARY 1985
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DREAM STUDIOS
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JAPAN DESIGN
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Bradbury Thompson The Art of Graphic Design Yale
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Neal Slavin
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COUNTRY FLOORS' DECORATING WITH TILES
Roslyn Siegel · Introduction by Norman Karlson
SIMON AND SCHUSTER
THE LAND I LOVE
Thomas G Aylesworth and Virginia L Aylesworth
IMOGEN CUNNINGHAM
ART
CHRISTOPHER LLOYD
Gallery Press
GERD KITTEL DINERS
INSIDE GOLF
California Wild Lands
THE ENCYCLOPEDIA OF BAD TASTE
Jane & Michael Stern
Roy Lichtenstein
Abbeville Modern Masters
R

From p.19.

First, the downsized A3000 housing covers up the most important of the six BNC connectors on the Toaster. Second, the power supply on the 3000 is not adequate for a Toaster system, particularly one equipped with expansion boards such as time-base correctors (TBCs). There were ways to get around these problems, but they weren't pretty. They included modifying the Toaster board or cutting a piece out of the 3000's metal case, and replacing the power supply with a heftier model.

TOASTIN' AND COASTIN'

Heifner Communications has come up with a far better way to add a Toaster to your Amiga 3000, one that doesn't involve renting the Jaws of Life. The Toaster Cozzy is an external box that fits on top of the A3000. It contains a circuit board with two video slots and a black-burst generator, plus a supplementary 45-watt power supply. This neatly solves both the case and power-supply problems, all without voiding any warranties.

Installing the Toaster Cozzy is simple. Just connect the shielded ribbon cable that runs out of the box to a daughtercard, and plug that card into the video slot of the 3000. Then, installing the Toaster card in the Cozzy is just like installing it in an A2000. Remove the four screws, open up the box, and plug the Toaster into the open slot. There are even labels on the back of the Cozzy for the six BNC connectors on the Toaster. Plug in the power cable, turn it on, and you're ready to go.

Operating the Toaster in a 3000 with the Cozzy is no different from using it in a 2000, except that the 3000 is much faster than a stock 2000. The built-in black-burst generator provides the Cozzy system with another advantage over the 2000 system. On the back of the Cozzy, there are five BNC connectors that provide synchronization signals for the Toaster and up to four video devices. All of your video inputs into the Toaster must be synchronized in order to switch between them, and using a black-burst generator is the preferred way of achieving this synchronization.

The only compatibility questions you might have about the Cozzy involve boards that plug into the headers on the Toaster, such as PreVue Technologies' Breadboard or the Y/C Plus. Heifner says that it has been working with those two companies, and it can make a special adapter that allows you to install a board like the Breadboard into the second slot in the Cozzy. Aside from this, however, the second slot is currently inactive, and cannot be used for a board like Opalvision that uses the video slot.

Amiga 4000 owners should also note that the Toaster Cozzy won't allow them to use a Toaster, at least not yet. Although it overcomes the problem with the cramped living conditions, the hardware and software of the 4000 are different enough that they prevent the current Toaster from working.

BEAUTY IN A BOX

The Toaster Cozzy provides a seemingly elegant method of adding a Toaster to an A3000, and prospective Toaster owners will want to work out the costs and benefits of using a 3000 instead of a 2000. Although the price of the Cozzy seems expensive for a mere expansion box, when you consider that it includes a five-output black-burst generator, normally $300 or more, the cost seems much more reasonable.

With the Amiga 3000 earmarked for eternity in the computer orphanage, the Toaster Cozzy provides soured owners with some relief in the form of Toaster support. Faced with the alternatives of selling their current system or redesigning them with a Milwaukee Sawzall, these owners are likely to find the Toaster Cozzy a much more palatable, not to mention civilized, solution.

—***Sheldon Leemon***

PAGESETTER 3

Gold Disk, $99.95

Hard-drive installable.
No copy-protection.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM (1.5MB for A600HD systems), dual floppy drives.
Recommended system: 2+MB RAM, hard drive, accelerator.

Basic desktop publishing with paint program and word processor.

With the release of PageSetter 3, Gold Disk is following the proven marketing strategy of offering "more for less." While this latest version retains the features that made earlier PageSetter releases popular, PageSetter 3 is packed with a surprising number of new features and capabilities.

A FLEXIBLE PACKAGE

All of these new features are wrapped up in the familiar "frames" interface used in previous versions of PageSetter. This system requires that text files or graphic objects placed in your document reside within a box. Once these boxes are created and filled with graphics or text, they can be resized, linked together, and moved about the document easily.

Text to fill those boxes can come from a variety of sources, thanks to PageSetter 3's robust support for a wide range of word-processing formats. Text files from WordPerfect (both Amiga and MS-DOS versions), ProWrite, excellence!, scribble! and Transwrite can all be imported into the program. For on-the-fly text generation, a text-entry tool is included for dashing out short bits of text such as headlines, titles, and subheads.

Unfortunately, that same import flexibility is absent as far as graphics are concerned; only IFF bitmaps and Professional Draw clips are supported. While PageSetter 3 will display color graphics (up to 16 colors) on any Amiga, A1200/4000 owners receive the added bonus of being able to display 256-color graphics on screen in their documents.

While graphics add impact and increase the readability of your document, font handling is truly at the heart of any desktop-publishing system. PageSetter 3 supports both Compugraphic and PostScript Type 1 fonts, although only one font is shipped with the program: CG Times.

The product packaging claims that PageSetter 3 supports PostScript Type 1 fonts; unfortunately, that support requires the use of the included "font manager" utility (created by Eyo Sama, former publisher of *AmigoTimes*), which converts Adobe Type 1 fonts into Compugraphic format fonts. The font manager is easy to use, although Gold Disk should have hard-coded support for PostScript Type 1 fonts into the program.

For desktop-publishing applications, the proof is in the printing. PageSetter 3 offers more flexible printing features than any previous version of PageSetter, supporting color output to a wide variety of printer types, including PostScript.

I tested PageSetter 3 on a number of different output devices, including a 9-pin dot-matrix printer, an HP-compatible laser printer and an inkjet printer. The Compugraphic font output was crisp and legible in all of the samples I printed. Speed was a problem with

Continued on p. 68.



High resolution color scanners. New from Epson.

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So drop by your computer store soon and take a look or call **1-800-289-3776** and ask for representative 81 for more information. Just don't be surprised if you end up with an Epson scanner.

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We put the ultimate Amiga display devices—monitors—on display, and reveal the "big picture" involved in choosing one.

On

BY SHELDON LEEMON

WHAT'S THE BEST monitor for your computer? That question is not as easy to answer as it might seem. It's a little like asking what is the best car to buy. If you're 20 years old and single, the answer might be a Miata, but if you're 40-something with five children, a Voyager is probably a better choice. In selecting a monitor, as with choosing a car, you must consider suitability as well as quality.

This is especially true of choosing a monitor for use with an Amiga. Although the various Amiga models can be made to work, after a fashion, with almost any kind of monitor out there, very few monitors work well with all Amigas in every situation. To match a monitor with your Amiga, you must first understand what kinds of signals the Amiga can generate, and which of these signals the various types of monitors accept.

Display Details

All Amigas can produce the three main types of signals computer monitors accept: digital RGB, analog RGB, and composite signals (though some models require the Commodore 520 adapter for the last). Therefore, the critical factors for determining whether or not a particular mode will display properly on a certain type of monitor are the horizontal and vertical scan rates that the mode produces. (For details on the Amiga's display modes, see "In The Mode," p. 31.)

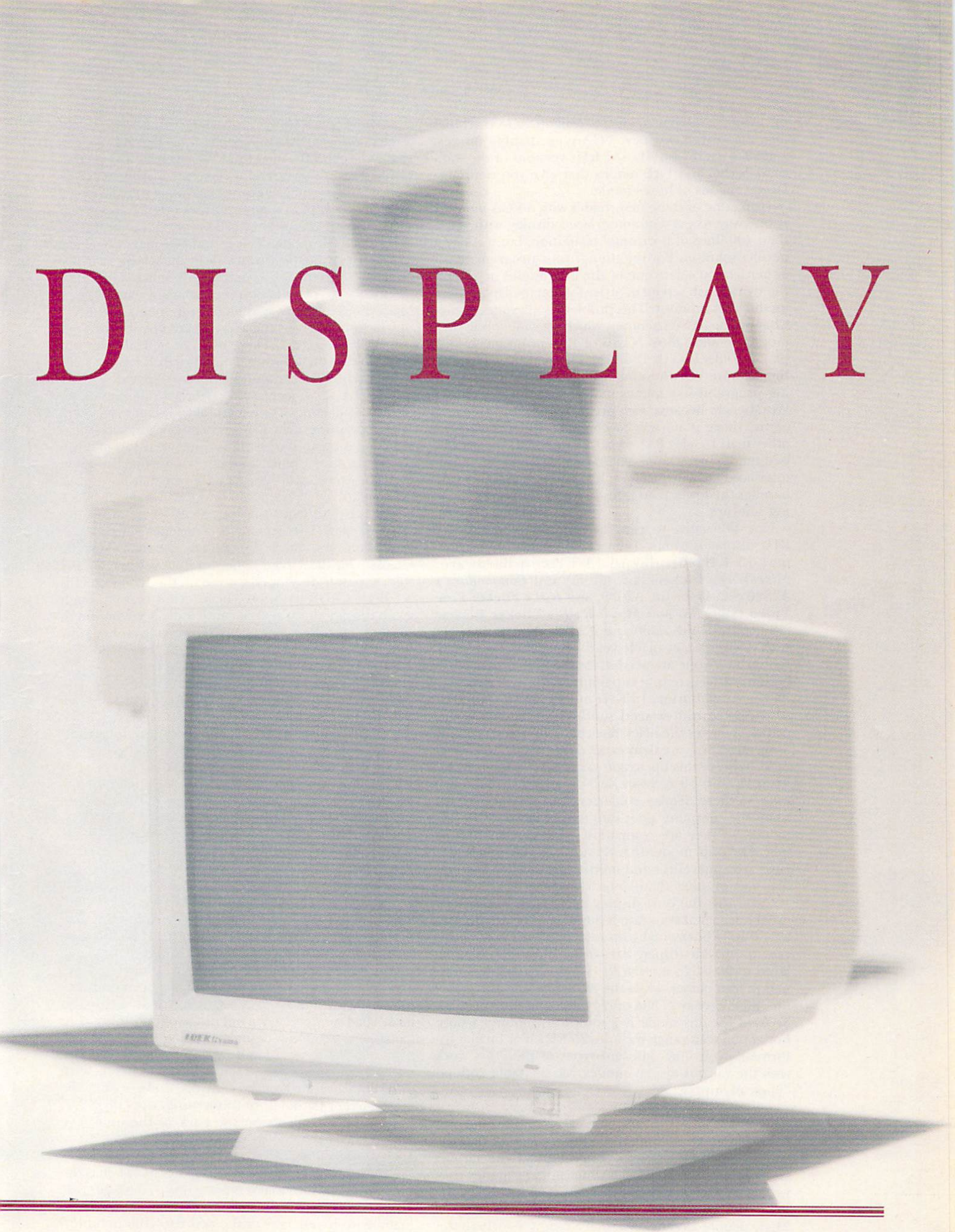
The original Amiga 1000, 500 and 2000 models output their signals at a single scan rate, which differs slightly depending on whether you are using the US display standard (NTSC) or the European one (PAL). These frequencies are 15.72 KHz horizontal and 60 Hz vertical for NTSC; 15.72 KHz horizontal and 50 Hz vertical for PAL. Because these are the same frequencies standard televisions employ, you can use either composite or RGB monitors with these modes.

In Amigas that have the ECS or AGA chip set (which includes most newer A500s, A2000s, and A3000s, and all models released after the A3000), the display output frequencies are programmable. Under Workbench versions 2.0 and later, Commodore offers a wide variety of new display modes, most of which require a special type of monitor. Of these new modes, only Euro36, which has a scan rate of 15.76 KHz horizontal and 73 Hz vertical, has a chance of working on CBM 1084-style monitors—and it works only on models that have a wide range of vertical adjustment.

Several new modes are meant to work with standard VGA monitors. These modes all have a horizontal scan rate of about 31.4 KHz, and a vertical scan rate of about 60 Hz, except for DblPAL which has a vertical rate of about 50 Hz. These rates are only approximate because some versions of the monitor drivers use slightly lower frequencies to boost the overscan area. If your monitor has trouble adjusting to these slightly varied rates, there is a VGA-only driver you can use to ensure that all of these modes use more standard VGA rates, although it comes at the cost of some size and positioning flexibility.

The new ECS VGA modes are Euro72, which offers a 640×400 noninterlaced display with a 70 Hz refresh (for even less flicker), and the misnamed Multiscan mode, a VGA clone that offers a 640×480 noninterlaced display at a 60 Hz vertical scan rate. With the ECS chip set, these modes are limited to a maximum of four colors out of 64, but on the A1200 and A4000 AGA machines, you can display 256 col-

D I S P L A Y



PHOTOGRAPH BY EDWARD JUDICE

ors from the full palette of 16.7 million. AGA machines also also offer two new VGA-type display modes, DblNTSC and DblPAL—31 KHz versions of the standard NTSC and PAL modes that give you noninterlaced versions of hi-res mode.

Using one of these new modes with a VGA monitor is one way to get a noninterlaced display with more than 400 lines of horizontal resolution, but it is not a perfect solution. For one thing, your programs must either let you select one of the new modes or run on the Workbench screen in order for you to display them on the VGA monitor. This problem is alleviated somewhat on the AGA machines, which provide mode promotion to allow most NTSC or PAL programs to display in DblNTSC or DblPAL. The real problem with the software/VGA solution, however, is with self-booting programs like games that do not open from the Workbench. Because such programs take over the machine, there is no way to convince them to appear other than 15 KHz PAL or NTSC modes. If you are depending on programmable modes to give you a noninterlaced VGA display, you'll also need a monitor that handles the lower scan rates in order to use self-booting software.

One alternative to using new modes to obtain a 31 KHz display is to buy a device that converts the normal 15 KHz display to 31 KHz in hardware. ***MicroWay's* flickerFixer** ($295) and ***Commodore's* A2320** ($291) for the A2000, and ***ICD's* Flicker Free Video** ($299.95) and ***Micro R&D's* Flicker Blaster** ($299.95) for the A500 and A2000, do just that. No such devices are available yet for the A600, A1200, or A4000, and none are needed for the A3000, which has built-in 31 KHz output capability. With such a display enhancer, all normal 15 KHz modes are converted to 31 KHz. Noninterlaced modes are scan-doubled (which removes the black lines between rows), and interlaced screens are deinterlaced (for flicker-free viewing). Because this operation takes place in hardware, it works with all software, even games. In addition, most of these display enhancers turn themselves off when the computer goes into one of its own 31 KHz modes, so they are compatible with these modes as well. The only modes that do not work with these devices are SuperHires and modes that use a horizontal scan rate of other than 15 or 31 KHz.

Currently, the only display mode that uses an unusual horizontal scan rate is Super72. This mode uses a 24.6 KHz horizontal scan rate, and a 72 Hz vertical rate, to provide display sizes from 400×300 noninterlaced to 996×628 interlaced. The ECS version is limited to four colors, while the AGA version can display the full 256 colors. The only type of monitor that can be used for this mode is a multiscan monitor whose horizontal scan range includes 25 KHz. For further information on how different types of monitors work with the various display modes, see the table entitled "Show of Support."

Fixed-scan Monitors

Now that we've examined the type of signals that the Amiga can produce, let's take a look at the various types of monitors, and see which Amiga modes they work with. Composite color monitors are generally the least expensive type of monitor to use with the Amiga. Many people already own such a monitor—whether it is a Commodore 1802 from an old C-64 system, or just a television set—when they buy their first Amiga. Because the A1000, A600, and A1200 have color composite output, you can hook them up directly to a composite monitor or TV. For other Amiga models, you'll need a 520 display adapter to make the connection.

A composite monitor will allow you to use the default NTSC or PAL modes, but will not display any of the new modes available through Workbench versions 2.0 and later. And though a composite monitor can display the full range of colors on the Amiga because it combines the red, green, and blue components of the signal, it cannot display the sharp detail needed for work with 80-column text. Therefore, a composite monitor is suitable if you use your Amiga strictly for game play, or if you use the computer primarily for video work, because it accurately reflects how your computer graphics will look on video. But if you want to run productivity software like word processors and such, plan on using a composite monitor only as a stop-gap until you can afford an RGB monitor—one that preserves the red, green, and blue signals and therefore gives better clarity.

Be aware, though, that not all RGB monitors are created equal. There are several varieties of fixed-scan RGB monitors, some of which are not really suitable for use with the Amiga. One example is the old CGA color monitor developed for use on the IBM PC. This is a digital RGB monitor, which means that although it can display sharp text, it can handle a maximum of eight or 16 colors. Because you probably chose your Amiga in part because of its colorful graphics, using this kind of monitor is self-defeating. Still, if you already have a CGA monitor, it's nice to know that you can use it for your Amiga in a pinch, providing that you can come up with the proper cable. Companies like Redmond Cable often make custom cables if your dealer does not carry the type you need.

The proper type of fixed-scan monitor to use with an Amiga is an analog RGB variety. Moreover, to display the default NTSC or PAL modes, the one you choose must have a horizontal scan rate of about 15.75 KHz. This combination is pretty rare—only a few manufacturers, including Magnavox and Thompson, ever made such a monitor. The only such model currently in production—at least as far as we could find—is ***Commodore's* own 1084S**. Priced at $388, the 1084 is the least expensive analog RGB alternative for most Amiga models. It is also quite versatile. In addition to RGB video, it provides stereo sound output, composite video, and separated Y/C composite video (S-VHS and Hi8 formats). This means that your computer monitor can double as a video monitor. Although most 1084 models have a full range of important controls—such as mode (digital or analog RGB and composite) and horizontal and vertical size and positioning—there are a lot of 1084 models, each with different variations on the controls. For instance, the most current model as of this writing, the 1084S-D1, has all these controls on the back of the unit. The 1084D, however, has a handier placement of mode switches on the front.

One major drawback of the 1084 is its .41 mm dot pitch, which means that it is not quite as sharp as some other monitors. Its other major failing, though, is its inability to handle any of the new 640×400 noninter-

laced modes. And because the 1084 does not accept the output of flicker-reduction devices, this means that the monitor's display will always flicker in high resolution. What's more, there are three different types of 1084 cables, and the one you require depends upon the particular 1084 variation you have.

These days, the most popular type of fixed-frequency RGB monitor is the VGA monitor used on IBM systems. Although this accepts analog RGB input, it synchronizes only to a signal whose horizontal scan rate is about 31.5 KHz. This means that while it displays the new 640×400 noninterlaced modes with no problems, in most cases it cannot display the default NTSC or PAL modes. The only exceptions are the Amiga 3000, which has a built-in scan converter, and flicker-reducer-equipped A500 and A2000 computers. For these computers, a VGA monitor is an excellent solution, as it can display all modes except Super72, Euro36, and NTSC/PAL SuperHires. Because this is the dominant monitor in the industry today, there is a dizzying array of models and styles from which to choose, and the menu changes almost daily. Selection is highly subjective, so my best advice is to try them out (because they are IBM compatible, you need not limit yourself to an Amiga dealership). One feature to look for among these monitors is a wide range of horizontal size and position adjustments. Many VGA monitors are not made to display from edge to edge, and therefore leave a thick black border (which some Amiga owners find annoying) around the screen.

For the majority of Amigas, which do not have hardware scan conversion of 15 KHz modes to 31 KHz, a VGA monitor is a much more dubious choice. On the A4000 and A1200, a VGA monitor will display most programs that run from the Workbench via Mode Promotion, which "hijacks" most requests for NTSC or PAL screens, and converts them to DblNTSC or DblPAL. It will not, however, be able to display self-booting programs, such as games that do not run from the Workbench. On ECS machines, a VGA monitor works only with programs that run on the Workbench screen, and not with most programs that open their own custom screen. On either AGA or ECS machines, you'll still need a 15 KHz monitor to perform the initial setup, because with a VGA monitor you cannot even see the default Workbench screen from which you choose a 31 KHz mode!

Multiscanning Models

Since the various Amiga display modes use different horizontal scan rates, the optimum solution is to find a monitor that handles all these rates. At one time, multiscanning monitors that handled the Amiga's range of frequencies (15–31 KHz) were very popular. Unfortunately, when IBM's 15 KHz mode (CGA) disappeared, so did most low-scanning multifrequency monitors. Although you may find a few of these monitors on store shelves, or sold as used equipment, very few are still being manufactured (see the sidebar "Where Have All the Multisyncs Gone?"). Of the remaining models, the least expensive is ***Commodore***'s own 13-inch **1960** ($699). (The inches indicate the measurement of the screen diagonally from corner to corner.) Because the 1960 works with all Amiga display modes, it is an excellent choice for use with any Amiga model. Other advantages include a .28mm dot pitch for a sharp, clear display, and an "overscan" switch that lets you extend the display from one edge to the other, eliminating the black border. Unlike current 1084 models, all the 1960's controls are at the front—a definite plus. About the only thing that the 1960 lacks is sound capabilities, but this deficiency can be easily remedied with a pair of inexpensive amplified speakers, such as those sold for use with Sony Walkman radios and IBM PC sound cards.

For those Amiga owners with special needs, there are a couple of multiscanning alternatives to the 1960. ***IDEK*** makes 15-, 17-, and 21-inch monitors that should satisfy those who need a larger-than-13-inch display. IDEK loaned *AmigaWorld* a 17-inch **MF-5017sp** for this article; it is the finest monitor I have seen on an Amiga. Despite its large display size, the unit itself is rather compact. It uses a Flat Square Tube, so that its screen is perfectly flat, rather than slightly convex as are those of most monitors. This substantially reduces distortion, particularly at the corners, and eliminates the bowed look you get with many monitors. The display is very bright, and the .31mm dot pitch makes it sharp. The monitor has controls for adjusting horizontal and vertical size and position, which are placed at the front of the screen and clearly marked for easy access. The range of the size and position controls is extremely wide, so Amiga owners will have no problem filling the entire screen without seeing a border. The monitor accepts signals with horizontal scan rates of 15 to 40 KHz, so it can handle all of the Amiga graphics modes. It also makes an excellent choice for use with a Bridgeboard and a SuperVGA card, displaying a 1024×768 interlaced screen under Microsoft Windows with no problem.

In addition to the 5017sp, ***IDEK*** makes the **MF-5017lp,** which uses a long-persistence phosphor. Long-persistence monitors substantially reduce interlace flicker, which may make the 5017lp the best choice to use with the 800×600 interlaced Super72 display mode. ***IDEK*** also makes the short-persistence monitor in 15- (**MF-5015**) and 21-inch (**MF-5021A**) models. IDEK's pricing is fairly low as oversized monitors go. The list price of the 15-inch model is $695, both 17-inch models are $1195, and the 21-inch 5021A is $1995. The company has recently started selling these monitors direct to the public at a discount, however. The 17-inch version I tested, for example, is available direct for $945.

If multimedia versatility is what you crave, you'll be interested in the ***Sony*** **GVM-1311Q** ($1295), which combines multiscan RGB capabilities with composite video. As a multiscan RGB monitor, the 1311Q covers a horizontal frequency range from 15 to 31 KHz, which allows it to display all Amiga modes. As a general-purpose audio/video monitor, it provides a wide variety of switchable inputs. There are two RGB inputs, one of which has an audio input, video-A input and output with BNC connects, video-B input and output with Y/C connectors and termination switch, and audio-in and -out for lines A and B. There is also a remote jack for switching the inputs, and another for controlling picture settings via a Sony Control-S device. The multiscan characteristics extend to the composite-video inputs also, allowing the monitor to handle NTSC, PAL, and SECAM signals. The monitor uses a Sony Trinitron tube with a .26 mm ►

SHOW OF SUPPORT

HOW COMPATIBLE ARE the various types of monitors with the several Amiga display modes? Here's how...

	NTSC	PAL	Euro36	Multiscan	Euro72	DblNTSC	DblPAL	Super72
Horizontal Scan (in KHz)	15.72	15.60	15.76*	31.44*	31.43*	29.20*	29.45*	24.62*
Vertical Scan (in Hz)	60	50	73*	60*	70*	59*	50*	72*
Composite?	Partly 1	Partly 1	Partly 4	No	No	No	No	No
CGA?	Partly 2	Partly 2	Partly 4	No	No	No	No	No
1084?	Yes 3	Yes 3	Partly 4	No	No	No	No	No
VGA?	A3000 only A500/2000 w/enhancer. No Super-Hires	A3000 only A500/2000 w/enhancer. No Super-Hires	No	Yes	Yes	Yes	Yes	No
High Multi? (SVGA)	A3000 or A500/2000 w/enhancer. No Super-Hi-res	A3000 or A500/2000 w/enhancer. No Super-Hi-res	No	Yes	Yes	Yes	Yes	No
Low Multi? (1960)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*** Scan rates and overscan display sizes for ECS and AGA modes are approximate. Because these modes are totally programmable, figures vary slightly depending on which version of the monitor drivers you are using. Some drivers lower the horizontal scan rate slightly in order to get a wider overscan area for modes like DblNTSC. More standard rates can be obtained from all modes by using the VGAOnly driver.**

1 While composite monitors display all colors in NTSC and PAL modes, the display is generally too blurry for use with 80-column text.

2 Digital RGB (CGA) monitors display sharp 80-column text, but with a maximum of eight or 16 colors. Not only is this less appealing, but because a large number of colors get translated to the same CGA color, some text and graphics may become indistinguishable from the background, rendering them invisible. And to use a digital RGB monitor with an Amiga, you must find (or make) a fairly rare 23-to-9-pin cable.

3 American 1084 monitors are guaranteed to work only in NTSC mode, and European models to work only in PAL. Because the horizontal scan rates of these modes are so close, however, the only real distinguishing factor is the vertical sweep rate. The control used to adjust this rate is the Vertical Hold knob. In several 1084 models, the range of adjustment is wide enough to lock to either 50 or 60 Hz, allowing the same monitor to be used with both PAL and NTSC modes.

4 Euro36 has a horizontal scan rate very similar to both PAL and NTSC, but a vertical rate of 70 Hz. In some 1084 models, the adjustment range of the Vertical Hold is wide enough to accept Euro36; in others it is not. —*SL*

Note: The different colors indicate which modes are accessible via the different chip sets. Red indicates pre-ECS machines, blue means ECS or AGA, and green means AGA only. Two popular public-domain programs, AIBB and SI, can tell you which chip set your machine has, if you are uncertain. □

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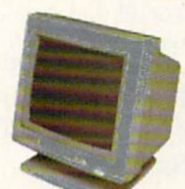
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WHERE HAVE ALL THE MULTISYNCS GONE?

TIME WAS, EVERY multiscan monitor was perfect for the Amiga. Since SuperVGA display cards have come out for the IBM, however, a new generation of incompatible multiscans has sprung up, and the old generation has almost completely disappeared. If you look around, however, you may still be able to find one of these once-popular models gathering dust on some dealer's shelf, or being sold as a used or display model.

Model	Manufacturer	Size (inches)	Horiz KHz	Vert Hz
CM-324	AOC International	14	15–36	50–90
CM-326	AOC International	14	15–38	50–90
Multiscan 3436	CTX International	14	15–38	50–90
AUM-1381A	Mitsubishi	13	15–36	45–90
Flexscan 9060S	Nanao	13	15–38	50–90
MultiSync*	NEC	13	15–37	50–80
PanaSync C1391	Panasonic Communications	13	15–36	40–80
Ultra 1200	Princeton Graphic Systems	12	15–38	45–120
MultiVision 770+	TAXAN America	14	15–37	50–90

*** Only the original Multisync or Multisync 3D uses these scan rates—all newer models scan from 30 KHz up. —*SL*** □

aperture grill, which is roughly equivalent to a .28 mm dot pitch. The monitor has a full range of front-panel adjustments, and the horizontal size and position controls allow you to almost fill the screen with minimal border. A 20-inch variation on the same theme is ***Sony's*** **GVM-2020**, which lists for $1595. The Sony units are not cheap, but are by far the least expensive monitors with this particular combination of features. ***NEC's*** 27-inch **Multisync 3PG**, for example, which covers the same range of RGB and composite frequencies, carries a price tag of more than $3000.

The final class of multiscan monitors are the models designed to bridge the gap between VGA and SuperVGA, scanning at horizontal frequencies between about 30–50 KHz. Although these are the most common type of multiscanning monitor you'll find today, their capabilities are largely wasted on the Amiga, which has a maximum horizontal scan rate of 31 KHz. For all intents and purposes, high-scanning multifrequency monitors function no better or worse on the Amiga than fixed-frequency VGA monitors. Unless you plan to use these monitors with a PC as well as an Amiga, you'll be paying extra for features you cannot use.

SHOW DOWN

The Amiga has very different display needs from other brands of computers. For this reason, the monitors Commodore designed specifically for the Amiga are still the best bet for the vast majority of Amiga owners. The 1084 is good for video enthusiasts, since it can display both composite and Y/C video in addition to RGB. It is also the least expensive RGB monitor you can find for your Amiga. The 1960 is more desirable for traditional computer applications, particularly for A4000 and A1200 owners, as it displays the "no-flicker" hi-res modes. Those who demand the very best, however, should look to IDEK's line of low-scanning Multi-Flat monitors, particularly the MF-5015, which is reasonably priced for a 15-inch screen.

The monitor situation is very different, however, for Amiga 3000 owners, and A2000 or A500 owners with flicker-eliminating devices. Because these boards convert all normal 15 KHz modes to 31 KHz, owners of these machines are free to choose virtually any VGA or high-scanning multifrequency monitor. If you decide to go this route, look for a monitor with a fairly low dot pitch (.31 or .28 mm), and a wide range of horizontal size adjustment in order to avoid a black border around your display.

What if you're considering a move to AGA? A monitor such as the IDEK will leave your options wide open, and allow you access to self-booting software from AGA. But while there's no Mode Promotion in hardware now among the AGA machines, Commodore may well provide it in the future. ■

Sheldon Leemon is a frequent contributor to computer publications, and the author of two books covering the Amiga. When he's not writing, he's often working at Slipped Disk, an Amiga dealership in Madison Heights, Michigan.

(Editor's note: At press time, ***AmigaWorld*** *learned of Commodore's plans to replace the 1084 and 1960 monitors with a new analog RGB model. The Quad Sync 1940 and 1942 are two variations on the same theme: The former has a dot pitch of .39 mm, while the latter provides a sharper display with a .28 mm dot pitch. Only the 1942, which is scheduled to retail for less than $699, will be sold in the US.*

The Quad Sync name refers to the monitor's ability to sync at the four horizontal frequencies Amiga modes require. The 14-inch swivel-based unit provides the most commonly used controls on the front panel, plus stereo sound via built-in speakers.

Commodore expects the new monitor to be available by the time you read this. While the company found that early production units did not support the popular Super72 (800×600 interlaced) mode, the issue is being addressed and, according to Commodore, anyone purchasing a 1942 should not have problems. Tune in to future issues for details.)

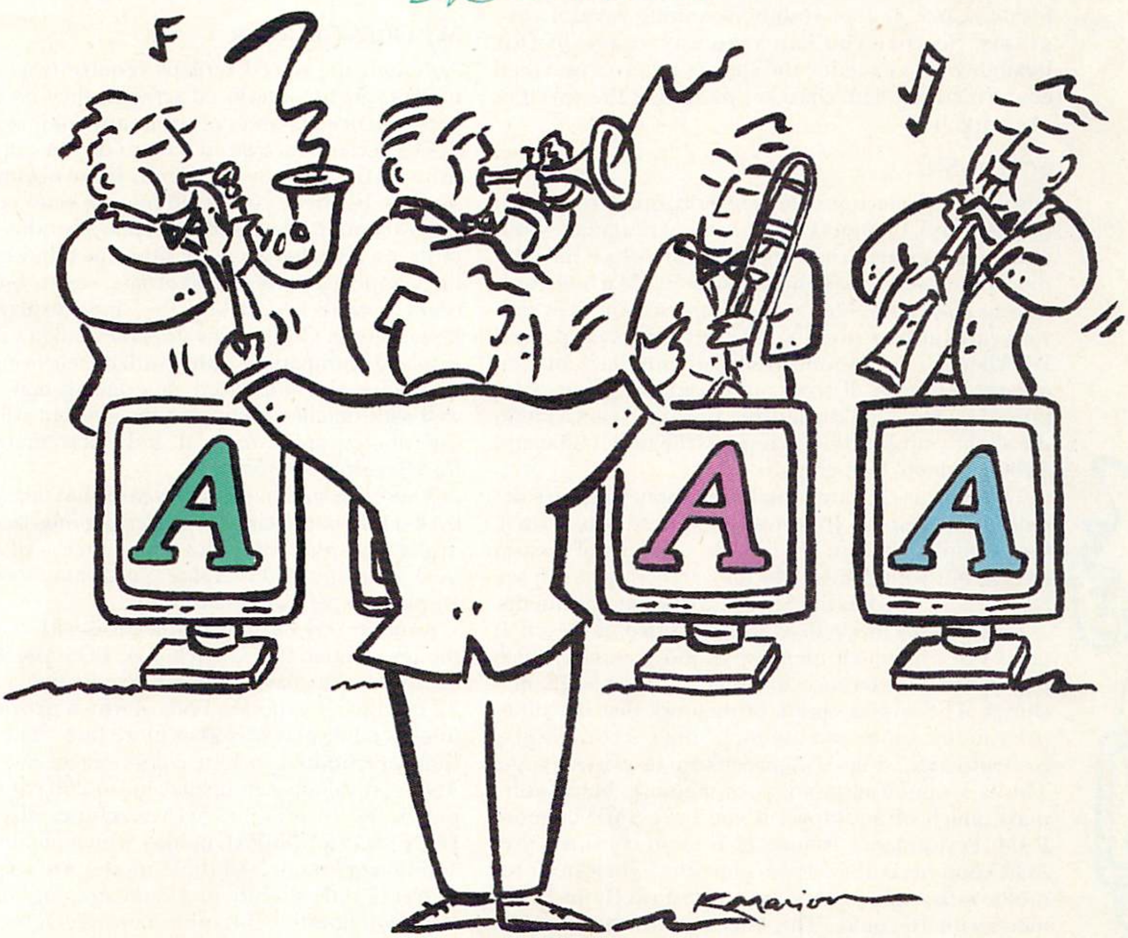
In The *Mode*

Can't swing the Amiga's big band of display modes?

We'll compare them, offer tips, and help you orchestrate their use.

AS AN AMIGA owner, you play band leader to many more graphics modes than IBM or Mac users. When you open a program like DeluxePaint IV, you can select a low-resolution, medium-res, interlaced, or hi-res screen; standard, maximum, or no overscan; NTSC or PAL format; and 2, 4, 16, 32, 64, or HAM color levels. To some extent, every graphically-oriented Amiga program (and aren't they all?) offers the same sorts of choices. While you may feel put upon for having to make all of these decisions, this flexibility lets you do it "your way." If you've been improvising on modes thus far, it's time you started directing them to your advantage. ►

By Sheldon Leemon



ILLUSTRATED BY KATE MARION

To appreciate all the Amiga's modes, you must understand how computers display pictures. A computer screen is made up of rows and columns of colored dots. The more rows and columns of dots, the higher the pixel resolution. The more colors from which to choose, the higher the color resolution. High pixel resolution is most useful for applications such as desktop publishing or computer-aided design that require very detailed displays. High color resolution is most important for working with continuous-tone photographic images, such as pictures of people and scenery.

While large pixel arrays and lots of colors are both desirable, it just is not possible to use the maximum amount of each. Adding pixels and colors not only increases the amount of memory needed, but also decreases the speed at which the computer can redraw the display. A display with 3000×3000 pixels and billions of colors would make our computers too expensive and slow to use. It would also be difficult to find—let alone afford—a monitor that could take advantage of such a display. For this reason, every computer display must make trade-offs between size and number of colors.

In the IBM world, a limited number of display modes are available. Most users run all of their applications in just one mode; and it is not easy to change modes within a program.

On the Amiga, however, each program can choose the display characteristics of the screen on which it appears. Furthermore, applications often leave this choice up to the user. This arrangement is well suited to the multitasking Amiga because it lets you allocate scarce system resources among several programs. So that you can take advantage of this flexibility, let's examine the choices in terms of screen characteristics. The chart on p. 33 lists the specifics of each mode.

Screen Size

Display size selections include horizontal resolution (lo-res, hi-res, or SuperHiRes), vertical resolution (noninterlaced or interlaced), and overscan (which includes the outermost edges of the screen area). Machines with Commodore's ECS (enhanced chip set) or AGA (advanced graphics architecture) graphics chips and Workbench software versions 2.0 or later have an even greater selection of size configurations. (Most computers made within the last two or three years contain the slightly updated ECS chip set; the new A1200 and A4000 contain AGA chips.)

The greater the horizontal resolution, the more detailed your display. In lo-res mode (320 dots across), for example, you can get only 40 columns of text on screen, but with hi-res (640 dots across), you can see 80 columns, which is the full width of most documents.

Using hi-res mode does have its price, however. It takes twice as much memory as lo-res mode, which may make a difference to users of older 512K machines. The largest chunk of memory that machines prior to the A4000 can use for a single screen display is about 128K, while AGA screens can be twice as large. This is a significant amount of memory, but it won't make much of an impact if you have 3MB or more RAM. Performance is another issue to consider. Pre-AGA computers slow down somewhat when in hi-res mode with eight colors, and significantly in hi-res mode with 16 colors. This effect is most pronounced if you have only chip RAM, but may still be noticeable even if you have fast RAM. Finally, hi-res screens in Amiga 500, 600, 1000, 2000, and 3000 models are limited to 16 colors. The new Amiga 4000 and 1200 models can display the full range of colors in hi-res mode, however, and performance does not begin to drop off until you get over 64 colors.

Under Workbench 2.0, the ECS chips provide a new horizontal resolution, SuperHires (1280 dots across). This mode is most useful when maximum detail is critical, as when trying to display very smooth, crisp-looking titles for video work. SuperHires incurs the same performance penalties as hi-res with 16 colors, but has even more severe color limitations—a maximum of four colors from a palette of 64. These limitations do not apply to the AGA machines, which can display up to 256 colors in SuperHires mode, and do not slow down until you get to the upper range of the number of colors.

Your other size choice deals with vertical resolution, but the issue is actually a little more complex than that. To achieve greater vertical resolution, the Amiga uses a process called interlacing. Instead of drawing every line of the display during each screen update (which happens 50 or 60 times per second depending on whether you are using a European PAL or American NTSC display), an interlaced screen draws only half of the lines each time. Your eye combines the odd-numbered lines drawn in one pass with the even-numbered lines drawn in the next. The result is a screen that is twice as high as a noninterlaced screen (400 lines in NTSC, 512 in PAL).

My Friend Flicker

Although interlaced screens require twice as much memory as noninterlaced screens, they do not incur performance penalties or suffer any color restrictions. That's because interlaced screens do not display more information at any one time than noninterlaced screens. In effect, you're alternating between displaying two noninterlaced screens, one after the other. Interlacing does have a nasty side effect, however. Thin lines appearing on one alternate screen but not the other cause flicker, making the whole display look like it's vibrating. On the plus side, the Amiga's interlaced display is compatible with standard television signals, which are also interlaced. Interlacing may not work well with detailed computer images, but it looks fine with photographic material, and is absolutely essential for television compatibility.

There are special display boards that take the drawback out of interlacing by converting interlaced screen displays at video scan rates to noninterlaced screens at VGA scan rates. They require special monitors (see "On Display," p. 24, for details).

Another way of fighting flicker is with new display modes. Under Workbench 2.0, ECS and AGA machines can display Multiscan Productivity and Euro 72 Productivity modes, both of which provide a noninterlaced display of 400 or more lines. The ECS versions are limited to four colors out of 64, but their AGA equivalents can display up to 256 colors from a palette of 16 million. AGA machines also provide DblNTSC and DblPAL modes, which include a hi-res "no-flicker" mode. All these modes are very similar, differing only slightly in screen size, and all require a special monitor. But other new screen modes com-



Screen Plays

Here are the specifics you need for masterful mode maneuvering.

	NTSC	PAL	Euro36	Multiscan	Euro72	DblNTSC	DblPAL	Super72
HORIZONTAL SCAN (in KHz)	15.72	15.60	15.76*	31.44*	31.43*	29.20*	29.45*	24.62*
VERTICAL SCAN (in Hz)	60	50	73*	60*	70*	59*	50*	72*
GENLOCK COMPATIBLE	Yes	Yes	No	No	No	No	No	No
DISPLAY-ENHANCER COMPATIBLE	Yes[1]	Yes[1]	No[2]	No[2]	No[2]	No[2]	No[2]	No
HORIZONTAL RESOLUTION (in pixels):								
Lo-res	320	320	320	320	320	320	320	N/A
Hi-res	640	640	640	640	640	640	640	400
Overscan	724	724	724	640	640	676*	676*	448
Super HiRes	1280	1280	1280	N/A	N/A	1280	1280	800
VERTICAL RESOLUTION (in pixels):								
Noninterlaced	200	256	200	480	400	200/400	256/512	300
Interlaced	400	512	400	960	800	800	1024	600
Overscan	482	566	400	990	800	934	1128	628
MAXIMUM COLORS:								
Lo-res palette map.	32	32	32	16	16	256	256	N/A
Lo-res EHB	64	64	64	N/A	N/A	64	64	N/A
Lo-res HAM6	4096	4096	4096	N/A	N/A	4096	4096	N/A
Hi-res palette map.	16	16	16	4	4	256	256	16
Super palette map.	4	4	4	N/A	N/A	256	256	4
AGA palette map.	256	256	256	256	256	256	256	256
AGA HAM8	262,144	262,144	262,144	262,144	262,144	262,144	262,144	262,144

* Scan rates and overscan display sizes for ECS and AGA modes are approximate. Because these modes are totally programmable, figures vary slightly depending on which version of the monitor drivers you are using. Some versions lower the horizontal scan rate slightly in order to get a wider overscan area for such modes as DblNTSC.

1 If you have a display enhancer, you will need to bypass it when in SuperHiRes mode.

2 None of these modes work with MicroWay's original flickerFixer. Some flicker cards bypass 31 KHz modes; some must be disabled manually.

N/A This resolution is not available in this mode.

bat flicker without requiring a special monitor. The Euro36 and Super72 modes redraw the screen 70 times a second instead of the normal 60 times (50 in PAL format). This does not eliminate flicker altogether, but does make it much less noticeable. Super72 makes some trade-offs between horizontal and vertical resolution to give you a screen size that is 800×600 interlaced, but it works only with a Commodore 1960 monitor or its equivalent.

Increasing the refresh rate to 70 Hz reduces flicker, but also reduces the maximum screen size. In general, modes with a lower refresh rate can display more lines. The European PAL mode, for example, which refreshes at the lower 50 Hz rate, has 256 lines in noninterlaced mode, compared to the 200 lines you get with the 60 Hz NTSC display used in the US. Under Workbench 2.0 and higher, of course, American users can switch to PAL mode for more lines, while Euro- ►

peans can switch to NTSC mode for reduced flicker.

The final factor affecting screen size is overscan. The Amiga has always been able to slightly extend the screen into the border area, although prior to the release of AmigaDOS 2.0, there was no standard way to do so. Using the 2.0 Overscan Preference editor, you can now select a slightly larger screen than the standard one provided in any mode. The standard overscan sizes you can set are Text (in which the entire screen appears within the visible area), Graphics (extends to the edge of the viewable area), and Max (expands the screen as far as possible). Extending the screen with overscan, as with any other method, increases memory use. Increasing the horizontal dimension can also decrease performance. Increasing the screen vertically with overscan, however, has no such effect on performance. Rather than making the system work harder each line, it only decreases the amount of time the it rests between drawing the bottom of the display and going back up to the top.

Color Depth

The number of colors displayed on screen can be just as important as the size of the screen. Most Amiga graphics modes use a palette-mapped scheme to determine which colors are displayed. Palette mapping means that instead of assigning a red, blue, and green color value to each pixel, you assign it a much smaller register number. That register number refers to a hardware location where the red, green, and blue color information is stored in the computer. Without palette mapping, you would need 12 bits of data for each pixel to get the 4096-color range older Amigas enjoy, or 24 bits of data for the 16-million color range of AGA Amigas. With palette mapping, you need only one data bit for two colors, each of which can be any of the 4096 or 16 million colors.

In palette-mapped modes, the total number of colors displayed is determined by the number of information bits per pixel. A single bit yields two colors, two gives four colors, three means eight colors, and so on up to the maximum number of bitplanes (five bits or 32 color registers on non-AGA machines, eight bits or 256 color registers for AGA). On pre-AGA machines, hi-res mode can have only 16 colors, instead of the maximum 32, and SuperHires modes can display a maximum of four colors from a palette of 64. AGA machines always allow the maximum number of colors to be displayed, regardless of screen size.

One advantage of palette-mapped graphics is that you can change every pixel of a particular color just by changing the contents of one register. This makes it easy to change all of the colors on screen at once, for "color-cycling" or flashing effects. Another advantage is that you can select just the number of bitplanes you need. If you are using a terminal program that requires maximum performance, cut back to two colors; if you're trying to get near-photographic results in paint software, use the maximum number.



In addition to palette-mapped modes, the Amiga offers a couple of extended-color modes. Both modes work only in lo-res or lo-res interlaced sizes on pre-AGA machines (the A4000 and A1200 offer all color modes in all resolutions). The first is Extra_Halfbrite, which doubles the maximum number of apparent colors (64 for the original Amigas, 512 for AGA machines). The extra colors this mode provides duplicate those in the color registers, but are half as bright in intensity. An even more useful extended-color mode is Hold and Modify (HAM). HAM uses hardware compression to give you 12-bit color (4096 shades) for six bits of data on earlier Amigas, and 18-bit color (262,000 hues) for eight data bits on the AGA machines. Compression is important when animating images with lots of colors, because the less data there is to move, the faster the rate at which you can flip through pictures in the animation.

Making Beautiful Music

Once you understand the trade-offs, you can make the Amiga's graphics modes work for you. Here's how:

- If your animation files are too large to fit on a disk or to play back in memory, or if the animations play back too slowly, consider reducing the number of colors or switching from high to low resolution. Four or eight colors may be plenty for cartoon-like art or text, and the memory savings will be significant.
- If you want to display photographic images only, you will probably get the best results using interlaced HAM. If you need to include text or detailed graphics on the same screen (as for video titling), you're better off with a hi-res interlaced screen, unless you own an AGA machine that can do hi-res HAM. A program such as Imagemaster (Black Belt) or Art Department Pro (ASDG) can do a surprisingly good job of converting a full-color picture to 16 colors.
- When running productivity software, use as few colors as you can. A desktop-publishing program, for example, will update the screen much faster in four-color mode than with 16 colors. When working with text-based programs, you may even want to use just two colors. The same goes for your Workbench screen. Is a "pretty" Workbench really worth the decreased memory and performance you get when you use all those colors? Stick with 16 or fewer colors for an AGA machine, fewer than four for older models.
- A good-quality gray-scale image will often look sharper than the same image in 16-color or HAM mode. You may even be able to get away with eight or four shades of gray—a considerable memory savings. When detail is more important than aesthetics, consider gray. The same advice applies to output for a black-and-white printer. Why design text and graphics in color when your printout is limited to gray?
- HAM mode yields good results when a program creates the HAM image, but may not do as well when you are editing the picture manually. Never alter the contents of the color registers on an existing HAM image—the result will probably be a smeary mess.
- Use the new modes in AmigaDOS 2.0 and up to create a comfortable working environment. If less flicker is more important to you than a large screen size, set your Workbench screen to one of the new 70 Hz modes like Euro36 or Euro72. If flicker doesn't bother you, switch to PAL or Super72 to gain real estate.
- Because vertical overscan takes few system resources and vertical size is easily adjusted on most monitors, feel free to use the maximum vertical overscan. Be a bit more cautious with horizontal overscan. By stretching the width to 672 pixels or so, you should be able to see 80 columns of text and still have room for window borders and a scroll bar. ■

The *AW* Amiga Fonts

Buyer's Guide

Part 2

VIDEO FONTS

IN SURVEYS OF video-production facilities, the most common use of computer graphics by far is for titling. Whether you are using a character generator or a 3-D program, you will need fonts to help you communicate your message most effectively.

Although we present information on most of the many Amiga fonts available, this guide cannot hope to be all-inclusive. Also, in the case of multivolume font series compiled over a period of time, we have tried to include information on the newer additions rather than rehashing descriptions of older volumes in the series.

The guide is divided into sections covering standard Bitmapped Fonts, ColorFonts, AnimFonts, Toaster Fonts, Compugraphic (CG) Fonts, and 3-D Fonts. A section on Font Utilities completes the guide.

Bitmapped Fonts

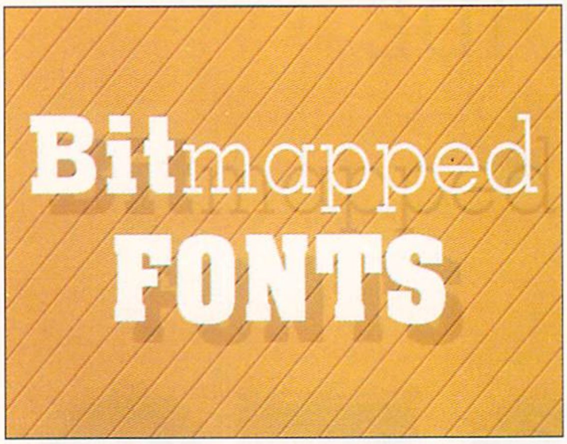
BITMAPPED FONTS ARE actually individual pictures of each letter that have been assigned to the keyboard using the standard Amiga font structure. While the most common format for Amiga fonts, it does have a number of limitations. Since the Amiga font structure lacks kerning pairs (in which the excess space found between some letter combinations is removed), you have to kern the letters together manually, and not all fonts support this without cutting and pasting in a paint program. Because video is fairly low resolution, there are not enough pixels to properly render a font so that it looks smooth and crisp, hence the jagged appearance of some curves and angular lines. You also have to have a separate font for each size that you want.

600 Amiga Fonts
Pushbutton Software
distributed by Vertical
$30

This is a mixed bag for video, as a majority of the fonts are too small to be useful. Even so, there are 250 typefaces, each in a number of sizes. These fonts were originally part of the BMUG Macintosh font collection. They were converted by Lion Kuntz, who recently sold ►

BY GEOFFREY WILLIAMS

the rights to Pushbutton Software. The conversions are well done, and there is a booklet showing all of the fonts in all of the available sizes. Chances are that you'll find use for some of them, and because they are very inexpensive it may prove useful to have them around.



Allied's Hi-Fi Fonts includes this among 67 typefaces.

Font City
Allied Studios
$225

This collection of 46 typefaces with a total of 270 fonts is a bitmapped version of Allied's 1st Prize Toasted Fonts (see below). Sizes are 50, 60, 80, 100, 125, and 160 pixels tall. Included is a booklet showing all letters of all the fonts and a keyboard-layout guide.

Hi-Fi Fonts Fonts
Allied Studio
$67

What makes this collection of 67 100-pixel-high fonts unique is the inclusion of Professional Page metric files. While this does not make them fully scalable, as with Compugraphic fonts, when used with Professional Page they can be scaled for better results than you would get in DeluxePaint. They also offer good typographic control through features such as built-in kerning pairs. For video titling, you can lay out the text in Professional Page (any version) and use a screen-grab utility. Included is a CLI-based screen-grab utility, which is nice to have but awkward to use. There are much better PD hot-key-based screen grabbers. While 21 of these fonts are also found in the Font City collection, that collection does not include the metric files. A sheet showing all of the font names in the corresponding style is provided.

ColorFonts

ONE WAY IN which the Amiga's bitmapped fonts really shine is when they are used in the ColorFont standard, in which fonts can have their own palette of up to 16 colors. While other platforms can render colored fonts, the technique is proprietary to each program. They lack a standardized color-font structure that allows any program to use them.

The only downside to ColorFonts is that they normally use eight colors, which is a lot in hi-res when you have only 16 colors available. With Workbench 3.0 and its support of 256-color palettes, however, ColorFonts prove extremely useful because you do not have to worry about using half your color palette for each font.

Masterpiece Anti-Aliased Fonts
ARock Computer Software
$199

While these fonts appear to be monochrome, additional colors have been added along the edges to create smoother curves and angles. This process of adding colors that transition from the font color to the background color is called antialiasing. While it is simple to change the palette to make the antialiasing match the background color (instructions are given on how to do this), you may have problems using these fonts over a background with a lot of light and dark colors.

Even so, the antialiasing looks very good, and this huge collection of 110 typefaces in multiple sizes ranging from 18 to 80 pixels tall will definitely come in handy. Included is a four-page sheet showing samples of all of the fonts, and a booklet of complete instructions. All of the fonts have been PowerPacked (a great compression utility available from your local dealer), reducing a font file from over 50K to about 16K—a great savings in disk space. You do need to run the included PPLoadSEG program first, which patches the system to automatically decompress these fonts when you load them.

Video Fonts II
Shereff Systems
$99.95

These fonts also have built-in antialiasing, but unlike the Masterpiece fonts (which have three levels of antialiasing), these have only one. In most cases, the fonts look just as good, as they were designed for video in the first place to avoid most of the jaggies problems. Only a few of the fonts that I examined would have benefited from more levels of antialiasing.

This set has the same fonts found in Shereff's Bread and Butter set for the Toaster. Each of the 17 fonts comes in 26, 38, 50, and 66 scanline heights.

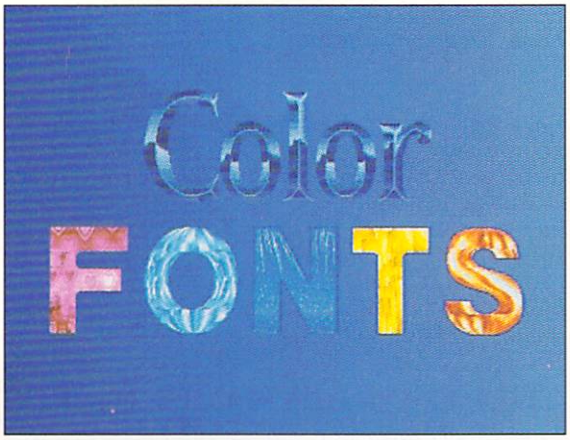
Kara Fonts
Kara Computer Graphics
Prices vary

Of all the ColorFonts available, none are better than these beautifully designed, well-executed sets. Kara squeezes more out of a limited palette than almost anyone, creating stunning fonts that look like glass, shiny metal, wood, and so on—all with realistic three-dimensional detailing. The newest font packages, Headlines 3 ($79.95) and Headlines 4 ($79.95), adapted from the outstanding Toaster ChromaFont series, are some of the best work yet.

The fonts come with a booklet describing how to use them, and the packaging displays full-color pictures of the fonts for reference. These fonts also support manual kerning by using the < and > keys to move the character a pixel at a time forward or backward.

Too Many Fonts
Mediascape
$79.95

While the thinking behind this brand-new font set may be obvious, the results are unique. What you get are ten



The word Color was created with Kara's Headlines 3; the word Fonts is from Mediascape's Too Many Fonts.

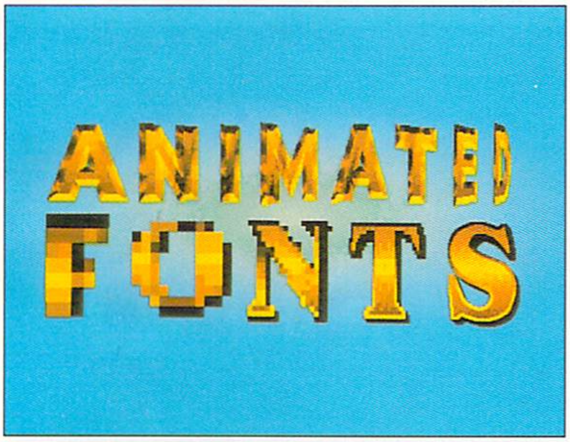
antialiased ColorFonts, each in two sizes, with kerning built in. The main body of the fonts are a single color, but included with the set are 200 brush patterns in various categories. They can be used in DeluxePaint, where you can either fill the fonts using a brush fill (which works very well, as the brushes are large enough so that you do not notice that a single brush is used on each letter), or stencil out all but the font color and do a tile fill of the entire screen. Although I looked at a prerelease version, what I saw was well executed and very promising. There is a lot of variety in the fills, letting you create fonts with rivets, metallic looks, various textures, gradients, and a great deal more.

AnimFonts

ACTUALLY, ANIMFONTS ARE not really fonts at all, but a set of animbrushes for each letter of the alphabet. Because of the amount of work required to create them, there are few products available.

Kara AnimFonts
Kara Computer Graphics
Prices vary

The originator of AnimFonts, Kara now has five sets



At top, one face from Kara's AnimFonts 4 collection rotates the word Animated onto the screen; at bottom, an Olo Animated Font 3 face depixelates.

available. AnimFonts 4 ($59.95), at 115 scanlines tall, are a shiny metallic script in which the outline of the character sparkles as the solid letter is drawn from left to right headed by a glowing sheen. A very pretty effect. With AnimFonts 5 ($59.95), at 104 lines tall, each character burns itself onto the screen in a fuse-like sparkling pen stroke. The effects of both are hard to describe in words, but the color pictures in the packaging provide a good idea of the results. I use Kara's AnimFonts frequently and strongly recommend them.

Olo Animated Fonts
ArtoVinjett
$59.95

This is a three-disk collection of the regular ColorFont versions of Olo Animated Fonts. Set 1 (Marmor) is the most bizarre of the three. Lumps of rock transform into rock-formed three-dimensional letters, and then become veined as if made from marble. Set 2 (Glider) is a three-dimensional-looking script font in which each letter appears in a burst of light. Then a sheen of light with sparkles moves slowly across the face of the letters, highlighting the face and the sides. It's quite pretty. In Set 3 (Gold), characters start out as a box of two to four squares that fly straight in and then pixelate into the letter.

Toaster Fonts

TOASTER CG FONTS are a proprietary antialiased font format for use with NewTek's Video Toaster. If you thought having a proprietary framestore format was stupid, how about a font format that is not even compatible with the developer's own paint program? Toaster Fonts can be used only by the Toaster character generator. Because of this, many font developers also include bitmapped versions of their fonts for use in ToasterPaint.

Fun Fonts
Allied Studios
$39.95

This is a collection of eight nicely designed, showy typefaces in several sizes from 40 to 80 scanlines for a total of 46 fonts. Also included are double-size bitmapped versions. The names are fairly representative, with fonts such as Circus, Frankenstein, and Flash Caps. The set also includes a very good manual showing all characters.

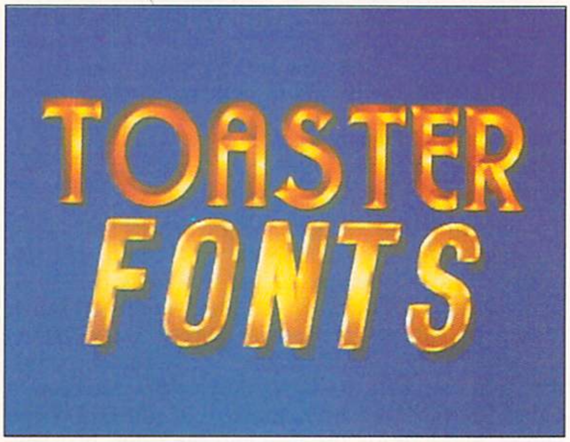
Variety Pack
Allied Studios
$99.95

If you are looking for a larger collection of novelty fonts, this offers an entirely different selection of 38 typefaces (105 fonts) in Toaster Font format only. You get unusual fonts made from bones, electricity, dripping blood, vines, and so on, along with some very nice scripts. There is a lot of variety and a very good selection to choose from. There is also a booklet showing all of the characters of each font.

1st Prize Toaster Fonts
Allied Studios
$150

Originally a five-pack set (at $69.95 each), these 39 ►

typefaces have been bundled into one large package offering 228 fonts. As with the original, this is a nicely designed collection consisting primarily of traditional sans-serif headline font styles. It is one of your best choices for a basic set of Toaster Fonts.



Kara's Toaster Fonts 3 puts words in your Toaster.

Masterpiece Toaster CG Fonts
ARock Computer Software
$99

This is ARock's huge Masterpiece collection of 110 typefaces with a single size of each in Toaster Font format. The average size is about 60, although fonts can range from 40 to 70. It includes an 11x17-inch folded sheet showing samples of all of the faces.

1st Prize Toaster Fonts, Latino Accented
Allied Studios
$120

With 11 typefaces in six sizes each, this is a good collection of standard faces that will prove quite useful for those working in the huge Latino market. These Toaster CG Fonts also include bitmapped versions.

Russian Toaster Fonts
Allied Studios
$359

This is a collection of 24 fonts in the Russian Cyrillic alphabet. The burgeoning Russian market offers a lot of opportunities, so the release is timely and useful.

EuroFonts Video
Classic Concepts
$164.95

A set of 14 typefaces supporting more than 20 European languages, EuroFonts are extremely easy to use. The set contains 18 distinct accents and diacritical marks that can be added to any letter with a simple keystroke. The fonts are provided in both Toaster and bitmapped formats, and this set has the best documentation around. You get a booklet on Toaster Fonts, one on video fonts, one on font basics, a plastic-coated keymap, a plastic-coated color card showing all of the letters in each font, and a booklet showing large versions of all of the fonts and a sample font set in several European alphabets. Outstanding overall.

Kara Toaster Fonts
Kara Computer Graphics
$99.95 each

Volumes 3 and 4 each add four new Toaster ChromaFonts in two sizes. Volume 3 provides a Gothic gold, metal, and a shiny gold metallic, as well as an extruded Roman font with a silver face and gold edges. Volume 4 provides three 3-D script fonts in gold, blue, and silver, and a gold calligraphic font. Unlike ColorFonts, ChromaFonts cannot use alternate palettes, but these fonts are so beautiful you'll be quite happy with the original coloring and design.

Compugraphic Fonts

As WITH PRINTED output, the future of video titling lies with scalable fonts, where instead of pixels, each font is described as a series of mathematical lines and curves. This lets you scale fonts to any size with a minimum of jaggies when rendered in bitmapped form (as they will be for video—for print use they can be output at the maximum resolution of the printer). The official format for Workbench 2.0 and beyond is the Compugraphic (CG) format, also known as Intellifont. There is yet no character generator for the Amiga that can load scalable fonts (although Montage, announced by InnoVision Technology but not yet available, will have proprietary scalable font technology).

Video Fonts
Gold Disk
$99

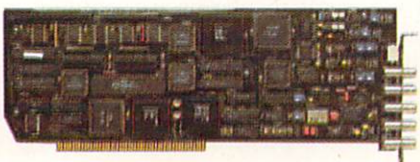
There are four sets currently available. These are basically the same fonts available for Gold Disk's Professional Page software, but they have been selected for video use. The most important part of the package is the Video Font Maker utility. It lets you render each type style as a complete bitmapped font usable in any program. You can control the horizontal and vertical aspect ratio, add a variable italics angle, adjust bolding both horizontally and vertically, and even generate a version in Toaster Font format. An instant preview lets you see what the font looks like before rendering. While there are only three fonts in each



Gold Disk's Sans Serif 2 Video Fonts collection includes this Microstyle font.



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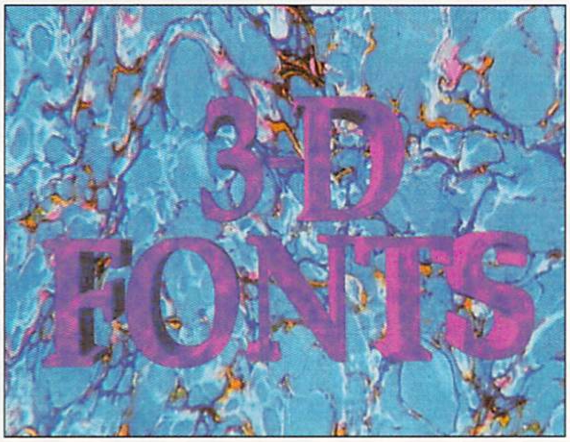
package, because of the flexibility you can render an entire font family (bold, italic, expanded, narrow) in any size you want from a single font.

3-D Fonts

ACTUALLY, 3-D FONTS are really collections of objects that can be loaded into 3-D programs. A handful of sets are available for those with 3-D titling requirements.

Broadcast Fonts 3D
Unili Graphics
$149.95

In my experience, these are the best of the lot. There are three sets currently available, each with a nice variety of nine fonts. Unili provides versions for Imagine, Caligari, and LightWave. Each object has additional, carefully placed points along the curves so that you can fly through the letters and they still look good. The brief manual conveys the basics, and it explains Phong shading (supported through multiple joined objects used for the sides to achieve the best output).



This Palladium face, from Unili's Broadcast Fonts, was rendered in LightWave.

Pop Arts
Pop Arts Inc.
$49.95

Each of the four volumes contains nine fonts and a disk of textures. The fonts are attractive and have a reasonable number of points so you can get fairly close and maintain the sides as separate objects for more accurate Phong shading. Personally, I prefer to spend a little more and get sets with more fonts in them, but if you wish to be selective, you can save money and get just the fonts you want.

Masterpiece Fonts for Imagine
Masterpiece Fonts for LightWave
ARock Computer Software
$99 each

Unlike the other 3-D fonts, these are not extruded and have little detail, which explains how ARock can get 50 fonts on only eight disks. This is the extreme low end among font selection.

Font Utilities

THE NUMBER OF font utilities on the market is quite slim. We do not have any text-effects programs like those available for other platforms. Currently, there is not even a good font editor available.

FlightPaths
Mediascape
$49.95

The Move requester in DeluxePaint is not the most intuitive, especially if you want to create smooth curved movement paths. FlightPaths solves this problem by taking advantage of DeluxePaint IV's ability to load and save moves from within the Move requester. By stamping down text and then loading a sequence of moves into the Move requester and selecting draw, you can get some incredible animation sequences for moving text on and off the screen. Curves, flips, spirals, zig-zags, loops, ripples, and many more effects are easy with this collection of 130 multistage movements. The manual describes each move to help you find the effect you are looking for, and there are some striking effects you would never think of on your own.

It also comes with several ColorFonts, which, while attractive, are not well designed for video use as there are some horizontal flicker problems. Even without the fonts, though, this package is more than worth the price.

Font Flyer
MD Grafix
$89

"Tedious" best describes the process of loading in text objects into a 3-D program and lining them up. If you are a LightWave user, that process has been greatly simplified by Font Flyer. It lets you choose a 3-D font and then select how it should be laid out from a set of nine options. Text can be set in a straight line or in several circular or arc configurations. The program then creates a scene file that you can load into LightWave. It's easy to use and does the job, and it also includes three fonts: Clarendon, Dom, and Times.

AntiA
Zen Computer Services
$59

A simple utility that does a good job of adding antialiasing to any font, AntiA produces a full antialiased ColorFont from the original at sizes from 1/2 to 1/12 the original size. It is fast and effective. A conversion of a full character set took only a few seconds, and the four-level antialiasing looks very smooth. ■

Geoffrey Williams is executive producer of CBC Communications and director and newsletter editor of the Amiga Video-Graphics Guild. Write to him c/o AVGG, 1833 Verdugo Vista Drive, Glendale, CA 91208. Please note: Backgrounds for the fonts screen shots illustrating this artiicle are from OpalPaint, JEK Graphics, and Texture City. Graphics were created by Geoffrey Williams and Dave Thomas.

HEAD TO HEAD COMPETITION

We put all Amiga scan heads together to come up with recommendations for the best scanning solutions.





If the pen is mightier than the sword, then what is the power of an image? A thousand words, at the very least—although the ability to get just the right image into your computer when you need it can be priceless.

Sometimes what you need on your computer screen is a photo. And now that OCR (optical character recognition) software has come to the Amiga, getting a picture of printed text can be equally valuable. But to incorporate such sources into an Amiga application, you must first convert them to digital data.

The scanner is the instrument of choice for digitizing anything two dimensional—and even very thin three-dimensional items. Video digitizers can bring both 2-D and 3-D images into your Amiga—but usually at lower resolutions. With a scanner, you can get professional print quality.

Thanks to the folks who have developed Amiga software interfaces to scanner hardware, there are more choices available to Amiga users today than ever before. They come in a dramatic range of sizes and prices. The smallest is about the size of the sandwich you had for lunch and can cost less than $150 through mail order. The top-of-the-line, professional models are bigger than your computer and command upwards of $12,000. Amiga-compatible scanners break down into three categories: handheld, wand, and flatbed units. Let's start our exploration at the low end.

(The addresses and phone numbers of vendors mentioned in this article are listed on p. 94.)

Give a Hand

HAND SCANNERS ARE the least expensive of all image-input devices. Don't let that fact fool you, though: The monochrome resolution of a hand scanner is as fine as that of a flatbed model. And a hand scanner's size and portability make it more suitable for some than any other type. Tradeoffs are lack of a true grayscale in the current crop, the limited size of an original you can scan in a single pass, and the additional work you must do to input the image.

I looked at four hand scanners, which have more similarities than differences. ►

By Morton A. Kevelson

PHOTOGRAPHED BY ED JUDICE

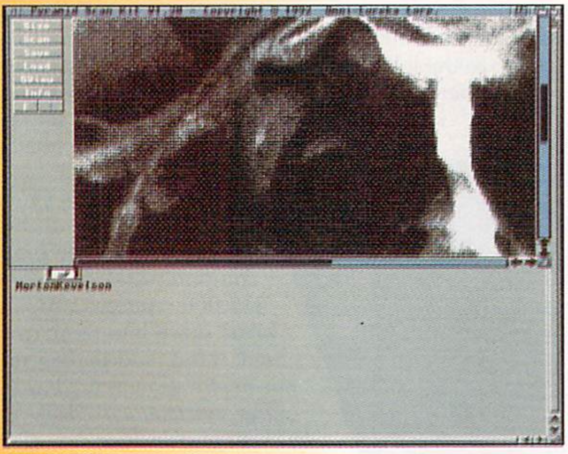
All look like the business end of a hammerhead shark, and provide switch-selected scanning resolutions of 100, 200, 300, and 400 dots per inch (dpi). A second switch lets you choose among line-art, text, and hardware-generated dither modes (the latter is designed for scanning photographs). In all cases, the scanning software can convert the dithered patterns into true gray-scale images. Keep in mind that the resulting image has one-sixth or one-eighth of the resolution used for the scan, and that the converted images are a fraction of the size of the original scan. Three dither patterns of various dot sizes are available in a photograph mode, and a rotary control lets you compensate for the brightness or contrast of the original material.

All the hand-held models have scanning windows four inches wide, which translates to 1632 dots at 400 dpi. While that limits the width of the scan, the length is limited only by your computer's available memory, and the length of the connecting cable, or your arm. A button on the scanner initiates the scan, and a small light on top indicates overspeed (too-fast movement). A green-tinted window lets you view the original as you sweep the paper.

Each of the hand scanners connects to the Amiga's parallel port via a supplied adapter. Finally, all come with their own power supplies.

Pyramid

Both the hardware and software components of the **Pyramid** hand scanner ($229.95, ***Omni-Eureka)*** are made in Taiwan. Although the Pyramid carries the lowest price of all Amiga scanners, it does not lack features. The parallel-port interface, at 5-1/2×1-1/2×4 inches, is larger than that of the other three, but it's the only one with a switchable pass-through connector, which means you can leave both a printer and the scanner plugged in to the Amiga at the same time. A two-foot cable lets you put the interface wherever is convenient for you.



The software for the Pyramid scan kit is comparatively minimal.



Many hand scanners come with versions of Migraph's Touch-Up software.

Clicking once on the Pyramid's scan-mode button starts the scanning operation. A second click interrupts the process and lets you reposition the scanner; a third restarts the scan. Not needing to continuously hold the button makes the Pyramid a little more convenient to operate than the other hand-held units. The scanner's overspeed indicator is nice: It remained dark until an overspeed was detected, flickered to indicate a possible loss of data due to overspeed, and glowed steadily when certain overspeed occurred. This scanner is the only one that also sounds a beep to signal overspeed.

The Pyramid software (version 1.30) is minimal when compared to that supplied with the other units. It lets you select among the four scanning resolutions and set the scan length. You can save, load, and view IFF images, and easily clip and save parts of the image separately. The software also lets you process, view, and save a single-bitplane scanned image as a true gray-scale graphic. Pyramid software supports gray-scale images with 16, 32, and 64 levels—based on both 6×6 and 8×8 dither matrices—although you can view only 16 levels of gray on screen. The supplied hardware generates photo-dithered images based on a 6×6 dot matrix, which limits true gray scales to 32 levels. The on-screen scanning window is limited to 640×200, or half of a hi-res, interlaced display.

I found the software to be partially compatible with the Amiga 1200. I was able to generate and process some scans, but each time I did, the software eventually crashed. According to Omni-Eureka, this problem should be resolved by the time you read this.

Migraph Hand Scanner and Touch-Up Migraph Super Hand Scanner Bundle

The ***Migraph*** scanning head is made in Japan. The 1-1/2×2×4-1/2-inch interface plugs directly into the computer's parallel port. Migraph has indicated, though, that the next batch of scanners may include a short parallel cable.

Unlike the Pyramid, the rest of the hand scanners—including Migraph's—require that you hold down the scanning button while you move the head over the paper. Simply releasing the button and moving the head then interrupts the scan (this is useful for assembling an image from parts of the original). I discovered that the Migraph unit scans slightly faster than the other hand-helds. It generates a 6×6 halftone pattern in photo mode, which the software can convert into a true 32-level gray-scale image.

The software supplied with the **Migraph Hand Scanner** ($299) is Migraph's own Touch-Up version 3.1, a combination scanning, image-processing, and paint program designed to manipulate single-bitplane monochrome images that the hand scanner generates. The **Migraph Super Hand Scanner Bundle** ($399) adds Migraph OCR Jr. version 1.4., which can convert scanned text from images to ASCII charaters for loading into word processors, spreadsheets, and so on. The

Jr. version of the OCR software has all the features of the full $300 version (for details, see the review, Oct. '92, p. 56), except the ability to load IFF images. This means it can process into text only things that the hardware scans in directly. These versions of the software proved to be compatible with the A1200 and A4000.

(Editor's Note: By the time you read this, Migraph will have debuted the Amiga's first color hand scanner—the ***CS-6000****—at the World of Commodore Amiga show in April. This exciting new unit promises 18-bit color scanning (for a total of 262,144 colors), plus true six-bit, 64-level gray-scale output at resolutions to 400 dpi. The CS-6000 is the same size as the other hand-helds, and will retail for $549.)*

Golden Image

The ***Golden Image* Hand Scanner's** ($239) scanning head and interface is made in Taiwan. The interface is the same size as Migraph's, but connects to the computer via a six-inch cable. When data loss occurred during scanning, the overspeed indicator flickered and then turned off.

I found the Golden Image scanner to be the slowest of the hand-held units. It generates an 8×8 halftone pattern in photo mode, however, which lets the software generate a true 64-level gray-scale image.

The software supplied with the Golden Image Hand Scanner is Migraph's Touch-Up 3.07 and Migraph OCR Jr. 1.3. These versions are identical to the ones supplied with the Migraph scanner, except they do not yet support the new AGA chip set.

AlfaScan
AlfaScan-Plus

The hardware ***AlfaData*** provides in both its packages is similar to that of Golden Image. Also like the Golden Image unit, **AlphaScan-Plus** ($299.95) comes with Migraph's Touch-Up (3.07v) software. Instead of OCR software, though, AlphaScan-Plus provides Merge-It, which lets you combine a pair of parallel scans to create a larger single image. And to help you position the scanner on a letter-size sheet to create scans suitable for processing with Merge-It, the package includes a plastic guide. This guide sets only the starting point for the scan, however; the rest is done freehand.

The **AlphaScan** package ($199.95) includes the same components, except that a program called Scan and Save replaces Touch-Up.

Wand To Scan?

CURRENTLY ONLY ONE scanner occupies the brand-new wand category: Migraph's PS-400 Wand Full-Page Scanner. It is essentially a larger version of the hand-held units, able to scan a full 8-1/2 inch-wide sheet in one sweep. An optional sheet feeder cradles the wand and draws the paper under the scan head at just the right speed, giving you a hands-off solution.

Migraph PS-400 Wand

The scanning unit of the **Migraph PS-400** ($899, *Migraph)* is 9-3/4 inches wide, 4-1/4 inches deep, and 2-1/2 inches high. It fits comfortably in the hand and pulls smoothly across a page on four rollers.

You can set the scanning resolution from 100 to 400 dpi, in 10-dpi increments. In addition to line-art and letter settings and a brightness-adjustment wheel,



A black-and-white original was the source for this 16-level, 300 dpi scan created with Migraph's PS-400 Wand. Scanning the same image with a hand-held unit produces remarkably similar results.



The PS-400 Wand uses an 8×8 dither pattern to produce 64-level gray-scale images such as this 300 dpi sample.



Produced from a 4×6 color original, this 300 dpi, 16-level Wand scan appears at exactly the same size on the screen as it does here. ►

there are four photo-gray settings that you enter via a three-button switch pad. (These settings are retained when the scanner is turned off.) The unit generates photo grays using an 8×8 dither pattern, which permits the creation of 64-level true gray-scale images. One-tenth of the resolution value is displayed on a pair of LED digits (34 represents 340 dpi, for instance); another set of LEDs shows the current photo or letter setting, and indicates when an overspeed occurs.

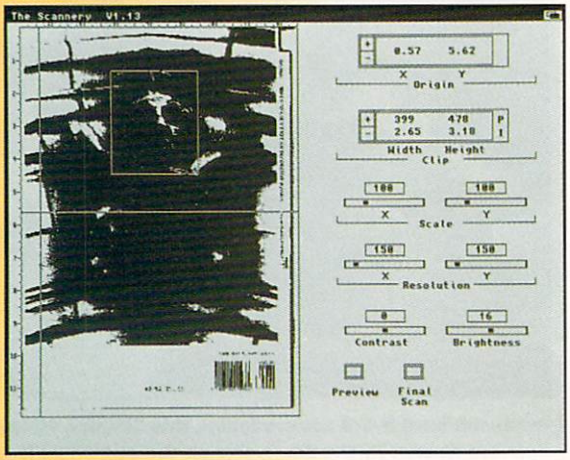
The PS-400 Sheet Feeder ($249) is an optional accessory that automates scanning. It has a 13×10-1/2-inch footprint and stands 10 inches high, including the sheet holder, which folds down for storage. The wand drops right into the sheet feeder, but must be removed from the cradle in order to change the resolution and Photo/Line Art settings. The feeder holds up to ten sheets at a time, and via software you can rapidly scan a series of pages, saving the files to disk. This application would benefit from a program ARexx interface, which would allow automatation of the process.

The PS-400 comes with Touch-Up 3.11, which has settings for the wand (for use with and without the sheet feeder), as well as for the hand scanners. Touch-Up always inputs a full-width scan from the wand. Although the program makes it easy to trim away excess material, scanning the full width eats up a lot of memory, especially at high resolutions. This can limit the maximum length of the scan from the wand if the computer has insufficient memory.

Besides Touch-Up, the PS-400 comes with the full version of Migraph OCR, which can load previously scanned and saved images.



Flatbed scanners can give you a full 256-level gray-scale scan, such as this one created with HP's ScanJet Plus.



The Scannery software provides a high-contrast preview of your scan.

The Lords Of Flatbed

FLATBED SCANNERS ARE generally the most capable type, but also the largest and most expensive. Amiga software supports Hewlett-Packard, Epson, and Sharp flatbeds. Unlike the hand and wand scanners, software interfaces for flatbeds are generally sold separately from the hardware. Let's look at the hardware, and at the Amiga products that support it.

HEWLETT-PACKARD SCANJETS

Scannery, from ***Concise Logic***, consists of software and a parallel-port interface cable for use with ***Hewlett-Packard***'s **ScanJet** and **ScanJet Plus** Although both models have been discontinued, they are still available on dealer shelves for around $600–$700, or through used-equipment channels.

I tested Scannery with the ScanJet Plus. The software offers full control of all scanner features via an easy-to-use single-screen interface. Half of the screen displays a low-resolution, monochrome preview of the entire scanner surface. While you can quickly crop the preview image using the mouse, the display does not zoom to the size of the clip. The absence of a zoom feature and the high contrast of the preview combine to impede visual fine-tuning with the mouse. The mouse's position and the clipped image's size automatically display on a digital readout to a resolution of 1/100th inch. The size of the clip in pixels is automatically updated to match any scan resolution you select, and you can direct the final scan to any storage device in IFF, PCL, EPS, viewable EPS, TIFF, and Applied Engineering fax formats.

The ScanJet Plus's hardware scanning resolution is 300 dpi; you can increase its vertical resolution by slowing the scanning speed. The device can also generate 12 to 1500 dpi resolution scans using built-in software routines; it produces data for resolutions of more than 300 dpi horizontal and 600 dpi vertical by interpolating from the lower-resolution hardware scan. You can vary the scanning resolution by single-dpi increments, specifying the vertical and horizontal settings independently. You can also adjust both the brightness and contrast of the scan over a range of 255 to 1. The ScanJet Plus can generate scans with 256 true gray levels. All of these features are supported by Scannery.

Scannery images include monochrome, true gray-scale with 16 and 256 levels and four dither patterns: 4×4 Fatting, 8×8 Fatting, 4×4 Bayer, and 4×4 Vertical. Scannery also includes ARexx support. When used with a ScanJet, the true gray scale is limited to 16 levels, the contrast adjustment is not available, and the brightness adjustment has only three levels.

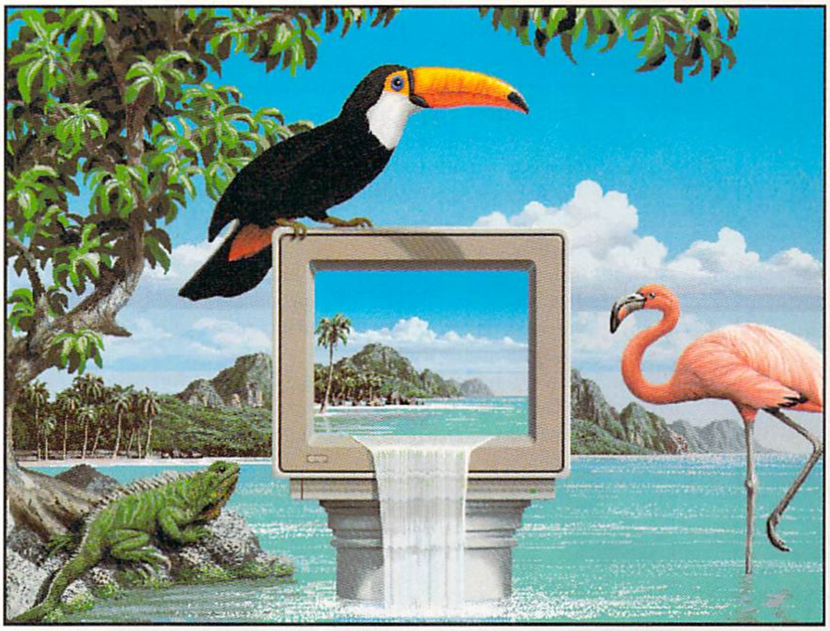
The ScanJet and ScanJet Plus have been superseded by ***HP's*** new monochrome **ScanJet IIp** and color **ScanJet IIc**. Because the IIp and IIc provide SCSI instead of parallel connection, they are incompatible with Scannery. ***ASDG***, however, plans to offer Amiga owners access to the ScanJet IIc via a **driver package** that ►

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should be released by the time you read this. The IIc provides 400 dpi resolution (800 dpi through ASDG's software) and retails for $1599.

Epson ES Series Scanners

The ***Epson*** **ES-600C** ($1129) and **ES-800C** ($1499) are 24-bit color flatbed scanners. Both can generate 16-million color scans, as well as eight-bit monochrome images with 256 gray levels, and single-bit black-and-white line art. The hardware scanning resolution of the ES-600C is 300 dpi, which can be doubled to 600 dpi via built-in software routines. The ES-800C's resolution is 400 dpi, though the scanner can double it to 800 dpi. The maximum scanning area for both units is 8.5 inches by 11.67 inches.

While both devices provide tremendous flexibility, there are definite practical limitations to their capabilities. A full-bed scan at 800 dpi would require more than 250 megabytes of RAM for 24 bitplanes, 125MB for eight bitplanes, and 63MB for a single bitplane! But scanning large images at low resolutions can produce excellent displays for video.

The ES-600C has a 13.3×22.7-inch footprint and is five inches in height. The ES-800C is about 10 percent larger all around. Both accept an optional transparency unit ($959) and sheet feeder ($599).



ASDG software drivers for the Epson and Sharp scanners provide the same interface.



This Epson 8-bit scan only hints at the power of the color flatbeds.

The **software driver** for the Amiga, which includes a parallel-port interface cable and also supports the older Epson ES-300C and ES-450, comes from ***ASDG***. Two versions of the software are included in one package ($200). One is a stand-alone "loader" that saves the image directly to disk. The other functions as an image loader and is designed for use with ASDG's image processor, Art Department Professional ($295), which is ideal for manipulating and displaying scanned images. ADPro also can produce a color display of scanner-generated 24-bit data; the actual appearance depends on the number of colors and screen resolutions your Amiga supports. High-resolution HAM8 images rendered on an Amiga 1200 were superb.

The software presents a two-part screen containing a preview window and a control panel. The window shows a low-resolution scan of the source material. Using the mouse, you can quickly crop the preview to define the size of the final image. You can adjust the clip precisely as the display zooms in on it. The control panel shows the dimensions of the clip area in English or metric units as well as in pixels.

You can set the scanning resolution over the full range supported by the hardware. The scanners provide both gamma and color correction for two kinds of CRT displays and three types of color printers; the software supports these as well. You can scan in full 24-bit color, eight-bit gray with up to 256 true gray levels, or one-bit monochrome with seven dithering options. Settings are provided for seven levels of brightness and five levels of sharpness.

The stand-alone loader offers the same scanning options as the ADPro version, but displays only the low-resolution gray-scale preview. Also, it lets you scan images that are too large or at too great a resolution to display with available RAM; the ADPro version limits the scan to what your system can display.

Sharp JX Scanners

ASDG's **Professional ScanLab II** ($499) is the software interface to Sharp's color flatbed scanners. Its operation and basic features are identical to those of ASDG's Epson drivers; any differences relate to hardware capabilities. The current version of ScanLab II was designed for use with the **JX-320**, **JX-450**, and **JX-600** scanners. The JX-600 has been superseded by the JX-610.

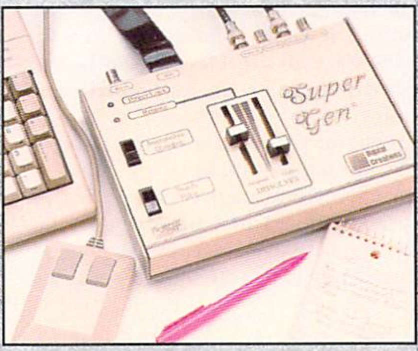
Unlike the other scanners I reviewed, the interface to the Sharp scanners is either a SCSI port or an IEEE-488 GPIB (General Purpose Instrument Bus) card. The GPIB was developed as a high-speed, eight-bit, digital interface between computers and other equipment. Professional ScanLab II is provided with an Amiga 2000-compatible GPIB card and a six-foot IEEE-488 cable. The additional hardware increases the cost of Professional ScanLab II as compared to that of the Epson kit.

The Sharp JX-320 ($1179) is a 300×600-dpi, 24-bit color, eight-bit gray-scale device with built-in hardware interpolation to 600×600 dpi. The scanning area is 8.5×11 inches. The ASDG software supports scanning resolutions of 75, 100, 150, 200, and 300 dpi with the JX-320. The software also supports four levels of edge emphasis or sharpness, gamma correction, brightness, and a threshold setting for black-and-white scans. All these settings are built into the scanning hardware. The software also supports an optional full- ►

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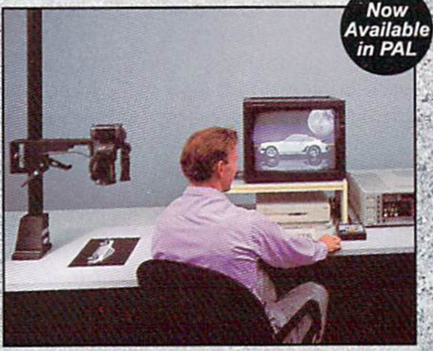


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bed transparency/film scan unit ($1195).

The JX-450 ($4995) provides 300×600-dpi scanning and also supports 24-bit color and eight-bit gray scales. Its scanning space is a full 11×17 inches. The JX-450's optional transparency unit is $500.

The JX-610 ($13,500) offers double the 320's dot resolution (600×1200 dpi), and increases color resolution to 36 bits (though output is limited to 24 bits), while retaining eight-bit gray-scale scanning. It provides hardware interpolation to 1200×1200 dpi and an 11×17 scanning area. While the box is 22 inches wide, 21 inches deep, and seven inches high, it requires a 40-inch-wide space because the scanning table moves the original across the scan head. When used with the JX-610, ScanLab II supports scanning resolutions of 400 and 600 dpi as well as those listed for the JX-320. The JX-610's price includes a full-bed transparency unit and both SCSI and GPIB interface ports.

Scanning For Answers

HAND SCANNERS OFFER adequate performance for printing on low-resolution output devices such as dot-matrix and laser printers. They work best with line art in text mode or with direct printing of dithered gray-scale images. The derived gray-scale images are of low resolution and are more suitable for video display than printing. Because there is very little to differentiate the hand scanners with regard to the basic hardware, you can shop by price and features. The Pyramid's switchable parallel-port pass-through is nice, but that package lacks the OCR software provided by Migraph and Golden Image.

Migraph's PS-400 Wand offers the same scanning resolutions as the hand units with a full-width head. The optional sheet feeder is convenient, but it kicks the price of the package into the same vicinity as that of the HP ScanJet, which offers true 300 dpi with 256-level gray-scale scanning. If OCR is important to you, however, then the PS-400 with sheet feeder may be the best choice. The price of sheet feeders for flatbed scanners is not negligible.

The small difference in price between the ScanJet and the entry-level color flatbeds makes the Epson ES-600C and the Sharp JX-350 attractive as well. If you need color *and* a larger scanning area, the Sharp JX450 and Epson ES-600C are worth considering. If you need the highest resolution possible, you should consider the Sharp JX-610.

You've got quite a selection to choose from, and the field continues to grow. As you can see, whatever your needs might be, there's an Amiga-compatible scanner for you. ■

Morton A. Kevelson, an electrical engineer, is a frequent contributor to Amiga publications. Contact him at Amiga-World *Editorial, 80 Elm St., Peterborough, NH 03458.*

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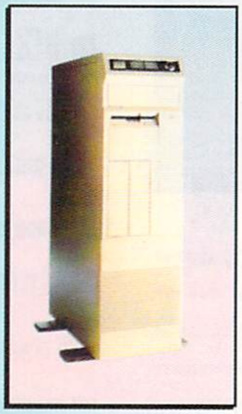
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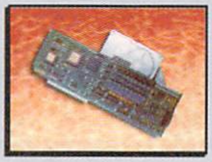
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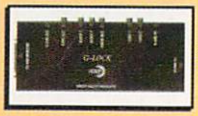
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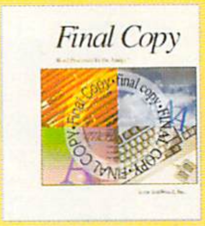
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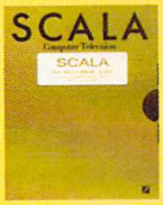


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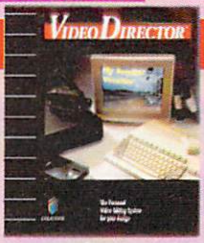
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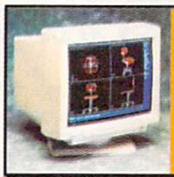
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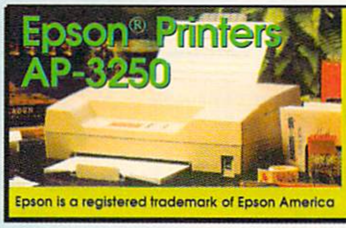
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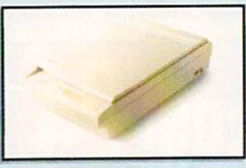
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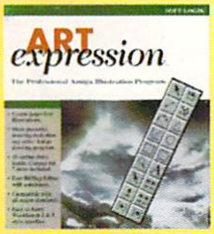
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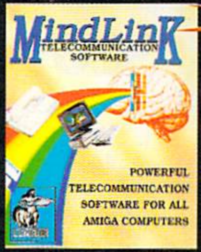
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Real-Time Genlock Effects

52

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

GENLOCKING COMPUTER GRAPHICS effects over video is one of the Amiga's strong points. While sophisticated video-graphics systems built around your Amiga can be expensive, we'll explore some real-time tricks you can try with just an ordinary genlock and a paint program. You may be surprised to learn these techniques can turn an otherwise complicated project into a few minutes' easy work—and provide some fun in the process.

A genlock attached to your computer allows Amiga graphics to be mixed with a video signal from a camera or VCR. The mix can then be viewed on a composite television monitor, recorded to a second VCR, or even passed to another Amiga/genlock station for further layering of video and graphics. At the simplest level, a genlock allows an input video signal to show through any part of the Amiga screen that is color zero, the first position in the palette. For example, if you clear a DeluxePaint (Electronic Arts) screen to color zero, any video coming through the genlock will fill the screen of a video monitor attached to the genlock output. Paint a line or a blob of any other color and it will be superimposed over the video.

Fly Fly Birdie

Often, it is desirable to synchronize an animated computer effect to a section of video or to wild sound. For example, you might want to create a video showing a cartoon bird flying over a real landscape, suddenly flapping higher in the sky to avoid a passing truck. Or perhaps you want a ray-traced rocket sled speeding through a forest, dodging trees and ducking under branches. Your first thought might be to shoot the video, time various movements of the sequence, and then use an animation program to create movement paths for the bird or rocket sled that will synchronize with the tape. This can be done, but it would be a laborious process eating up a lot of disk space.

As an alternative, try these quick low-tech methods. For the bird project, create a looping animation of four or more frames in DPaint showing a complete flapping cycle. Pick this up as an animbrush (as in the accompanying illustration), clear the screen to color zero, and turn off the tool and menu bars. Press the Delete key to turn off the pointer and play the videotape sequence through the genlock, observing the result on a video monitor. Watch the sequence once or twice to get the feel of it, then try the animbrush. Press and hold the 8 key to cycle the cels of the animbrush in a continuous loop while you move the mouse around. Do not press the mouse button. You will see the bird fly around the screen, superimposed over the video. It is easy to respond in real time to the action and move the bird higher on the screen as the truck passes.

The rocket-sled project employs a variation on this idea. Shoot the video at a slow frame rate while walking through the woods. When it is played back later at 30 frames per second (fps), you will see a dizzying effect of high speed. Render or paint the rocket sled seen from the rear as though you are following it. A color-cycled blinking light adds to the realism. Rotate the sled to create a minimum of three positions for level flight, left bank, and right bank, respectively. Experiment with intermediate frames if you like. Save these frames as an animbrush as you did with the bird.

Now play the video sequence of the forest chase and keep the animbrush in a clear path as trees whip past. Have two fingers resting on the 7 and 8 keys while you control the position of the brush with the mouse. Again, do not press the mouse button, just guide the brush. The 7 key moves backward through animbrush cels and the 8 key moves forward to bank the rocket left or right as you dodge around trees.

Take a genlock, some simple graphics, add a little digital sleight-of-hand, and—presto!—you can create fancy animated tricks in a matter of minutes.

You might be surprised at how effective three cels can be when the object is being moved in real time with the mouse. On the other hand, rendering a similar animation to synchronize with events in the tape could be a nightmare.

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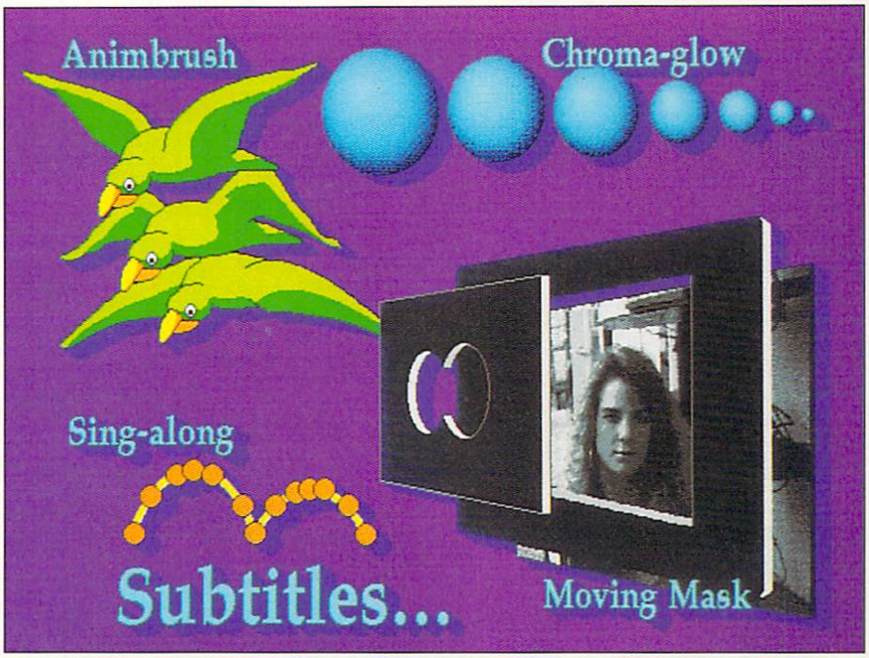
You can also get great real-time effects without an animbrush. Even the simple blue ball in the illustration (top right) can be amazingly effective in a video if you stage the scene well. For example, you can create the illusion that the ball is glowing by projecting blue light onto the face of a character in the video as it is shot. Later, move the brush in sync with the movement of the light for a superb illusion. You can even capitalize on the "chroma-crawl" of over-saturated colors. Purposefully use saturated blue or red to give a soft-edged glow to the brush in NTSC. You can use the + and – keys to give the illusion of movement into the z-axis of the scene. To complete the illusion, direct your actors to react to the ball (which will actually be added in post-production).

Bouncing-ball sing-along effects (illustration, lower left) are also a good use of real-time synchronization to sound. In addition, subtitles (illustration, lower left) are easy to sync to dialogue by creating an animation of the series of titles against color zero. Simply use the 2 key in DPaint to advance through the frames on cue. You can also use the j key at any time to cut to a transparent screen.

Try creating a moving-mask effect (illustration, lower right) such as a binocular view or a telescopic sight that tracks a character. Assuming color zero is already black, make a second black somewhere else in your palette. Use this black to create a border that obscures the edge of the overscan frame but leaves a window in the middle for the action. Use the same black to make a brush the size of the screen with a color-zero hole in the middle. Move this mask brush around the screen to track your character. The overlap with the black overscan border prevents the video image from leaking around the edge of the moving brush.

These simple real-time tricks are not as clean as double-buffered animation, but they often work surprisingly well. For moving large or complex brushes you may need to use low resolution to minimize the flashing that can occur. The character of the final NTSC image helps cover up flaws. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.



The screen above illustrates many of the real-time genlock tricks presented in the article. Brushes are synchronized to sound and video action by hand rather than as rendered animations.

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FX For Everybody

Special-effects programs can be just the ticket for many everyday video situations.

By Paulo de Andrade

SOME PEOPLE FEEL special effects are, well, "special"—that is, they're very useful, but only for working in high-end projects, music videos, or expensive television commercials. Fortunately, that just isn't so. The kinds of effects possible with programs like ADSG's MorphPlus ($295), Black Belt Systems' Imagemaster ($199.95), or GVP's ImageFX ($249.95) can help you in your everyday productions by providing you with imaginative transitions, economical special effects, and even quick fixes for common video image problems.

Let's examine some practical uses for these programs that you might find useful in your day-to-day video-production work. Be advised that to take advantage of most of the techniques described here, you will need not only the software but also a framegrabber and a frame-accurate VCR.

Morphs as Transitions

Morphing, for example, offers one of the more effective transitions when you are dealing with "before-and-after" situations. Let's say that you are producing a video for a diet center and you are supplied with several photos of clients who have lost a lot of weight. Anyone could place the photos side by side for comparison, but creating a transition between them would be more interesting. While you could do a dissolve from one to the other, you can morph between the images to produce an even greater impact. The person will seem to lose weight before your very eyes, and the transition will appear to be much more subtle than with a dissolve.

Similarly, you could use morphing to demonstrate how a body builder has gained mass during a certain period. With morphing between the before and after pictures, you can create a very interesting transition that intensifies the feeling of progress. If you remember to keep the angle, lighting, and other details the same in shots, the effect will be smooth and quite successful.

Morphing transitions can also replace dissolves in many other situations, such as in showing the progress of the construction of a building, the fixing of a damaged car by a body shop, or the transformation of a person's appearance through plastic surgery.

The Digital Dissolve

While morphs can often replace dissolves, there are other occasions when the latter are the best and most effective transitions. But you may be surprised to learn that morphing packages can also be used to create digital dissolves between two images. For example, GVP's CineMorph (included as part of ImageFX), has a built-in "Dissolve Only" option especially for this purpose.

Digital dissolves are useful in a variety of situations. The simplest one involves creating a dissolve between two images as part of an animation that can be played back in real time on your Amiga. Just make sure the dissolve is rendered in the same screen mode as the rest of your animation. Digital dissolves are also handy when you don't have access to a switcher or two playback VTRs. Simply grab the two images, perform the dissolve, and then output the frames back to tape. If you have access to a single-frame recorder and a good framebuffer, the rendered images will look as good as the originals.

Another great use for digital dissolves is in simulating surface-texture morphing in 3-D animations. NewTek's LightWave 2.0, for example, allows you to morph between two objects but not to morph their textures. The texture mapped to the first object is automatically transferred to the second. But by using your morphing software to perform a digital dissolve between two textures, you can map the resulting frames as a sequence on the first object. Be sure to create the dissolve with the same number of frames as your morph. When you play back your animation, you will get a perfect morph between the objects, including the textures.

No More Jump Cuts

Another type of transition where morphing comes in handy is the jump cut. A jump cut occurs when there is a sudden change in an image while the camera is paused in the same position and there is a need for continuity. A very common example is in the case of interviews, when there are no cutaway shots available to be inserted to disguise necessary editing. If you simply cut part of an answer off, your on-camera talent will suddenly "jump" on screen, sort of like Max Headroom.

Before the advent of the accessible morph, editors used to perform dissolves between the images to minimize the problem. Dissolves, however, cannot cover big changes in images, and they give the edit away. Morphs, on the other hand, are powerful transitions that when applied well can perfectly disguise jump cuts. Just make certain that the morph does not last more than

Continued on p. 66.

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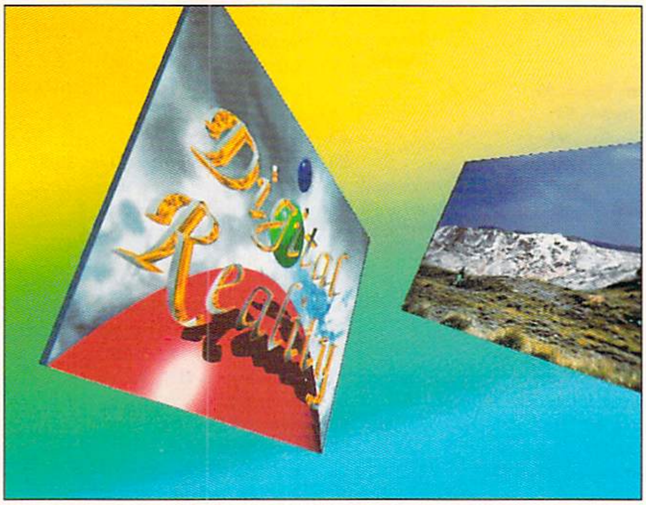
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a few frames. Also, be sure to use as many control points as possible to ensure that you avoid distortions.



With MorphPlus' Perspective effect you can have a two-channel DVE at your disposal.

The One-Frame Morph

Besides providing effective transitions, morphing can also save your video footage when you get in a fix. By using a one-frame morph, you can replace damaged frames with excellent results. As an example, when I work with 3-D animations, I usually render my frames to a hard disk before recording them a frame at a time on video—instead of recording them as they are rendered. This way, if anything goes wrong during the recording process, fixing the problem does not involve having to render all the frames again. On one occasion, however, I had to render directly to tape because I was temporarily out of storage space. Of course, something had to go wrong. A bad sync cable caused the single-frame controller to record two blank frames during the animation. As I could not afford to render the whole animation again, I resorted to morphing to fix my problem.

First, I grabbed the frames immediately before and after the missing ones. I then took the first couple of frames into the morphing software and performed a one-frame morph between them. The resulting frame was a perfect interpolation between the two images. I repeated the operation for the second missing frame and then recorded the new frames at their respective places. When I played back the animation, it seemed like nothing had ever been wrong with it and no one was able to tell it had been fixed. Best off all, it took very little time to accomplish.

You can use this technique to replace frames with almost any kind of glitch, including bad dropouts.

Moving Backgrounds and Overlays

All three of our special-effects packages also allow you to create the kind of rolling backgrounds that you see all the time on CNN, MTV, and the other TV networks. The background moves smoothly in a given direction while the graphics in the foreground remain static, or even while another layer of graphics moves in a different direction. The secret to producing such an effect is to create a seamless background, that is, an image that will not show a seam when moved around.

Once your background image is perfect, you can have the effects program perform the roll effect for the number of frames you need. After the roll animation is finished, you can superimpose your graphics by using either a switcher or software capable of creating good overlays. FRED, the frame editor that comes with both ASDG's Art Department Professional and MorphPlus, offers excellent layering capabilities. You can even create a second layer of movement by leaving open spaces in your screen or by using transparency in the compositing process. If the layers move in different directions, you get a great sense of depth.

This same effect, which can be so easily rendered with your Amiga, often requires very expensive digital-video equipment when created in traditional post-production suites.

Program-Specific Tips

MorphPlus not only provides great morphing capabilities, but also includes several other handy operators. One of the most useful is Perspective. With it you can achieve results very similar to those using an Ampex ADO or other sophisticated high-end DVE (Digital Video Effects) generators capable of perfect compression and perspective. Although NewTek's more affordable Video Toaster offers lots of nice DVEs, it can't perform this particularly useful effect on its own.

Let's suppose that you need to display a graphic in a small, slanted window, just like you see everyday in the television news. Simply use MorphPlus' Perspective to compress and position your image where you want it. After a few minutes of rendering, you will end up with a very high-quality graphic. You can then key the graphic in with the Toaster (or any other switcher). If rendering time is not a problem, you can use MorphPlus to animate the perspective and even apply multiple layers of moving graphics to create a very dynamic presentation.

If you're handy using ARexx scripts, you can animate practically all of Imagemaster's effects to create some very interesting transitions. For example, you can use the Spiral Blur function to progressively increase the amount of blur for the first image; when it becomes indistinguishable, cut to the second image—using the same amount of blur—and gradually decrease the effect until it is completely gone. A transition like this may be impossible to reproduce even with very expensive DVEs. Other interesting effects that can be used for effective transitions include Water Color, Relief, Implode/Explode, and even the Contour filter.

The ARexx interface included with ImageFX also allows you to create very exciting transitions. Ever wanted to recreate the classic spinning front-page newspaper-headline sequence used in old black-and-white films? ImageFX's Rotate operator makes this an easy task. Or how about having unlimited wipes at your disposal? The program's Wipe ARexx script creates a transition between the main and swap image buffers by using an animation and an alpha channel to control the mixing. All you do is design the wipe you want.

While I would love to show you dozens of other nifty effects these programs can perform, there is just not enough space to do so. But that doesn't mean you can't go out and experiment for yourself. Perfecting your expertise with your program's features will increase your confidence—and keep you a step ahead of the competition. ■

Paulo de Andrade is president of a company that uses Amigas in broadcast-quality video production.

Circle 34 on Reader Service card.

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larger documents; documents with several bitmapped graphics and/or more than a dozen pages took considerably greater amounts of time to print.

More for Your Money

Since Gold Disk has taken the "value-added" approach with PageSetter 3, a variety of utilities and mini-applications have been thrown in to sweeten the deal. Chief among these are the graphics editor and article editor, a paint program, and a word processor. Admittedly, the paint program is limited to 32 colors and the most basic of drawing tools. The article editor is actually a version of Gold Disk's Transwrite word processor, modified for use with PageSetter 3 and equipped with a 90,000-word spell checker.

Maximizing the usefulness of these programs is a "linking" feature that lets you jump out of PageSetter, edit your object (text or graphic) in the appropriate editor, then send the edited item back into PageSetter 3. For the artistically challenged, Gold Disk has also bundled more than 100 pieces of structured clip art, offering a ready-made graphic solution for Amiga publishers looking for jaggie-free clip art.

PageSetter 3 requires at least two floppy-disk drives and 1MB of RAM (1.5MB for Amiga 600HD owners) for operation; if you're planning to create multi-page newsletters and other large documents, I'd recommend at least 2MB of RAM and a hard drive to help speed things along. A Commodore-issue installation utility is provided to copy the contents of the three program disks to your hard drive, where they occupy approximately 2MB of hard-drive space. The program ran politely under both AmigaDOS 2.0 and 3.0, and it ran exceptionally well on AGA Amigas.

In the final analysis, PageSetter 3 is possibly the best deal in Amiga desktop publishing today. The underpowered graphics editor, limited font support, and weak graphics importing capabilities, however, preclude the use of PageSetter 3 for more demanding publishing projects. If you're looking to publish magazines or perform process color separations, look elsewhere. For small-scale publishing projects, though, PageSetter 3 is too much of a good deal to pass up.

—Jeff James

DeluxePaint IV AGA (V4.5)

Electronic Arts, **$199.95**
(upgrade for registered users, $37)

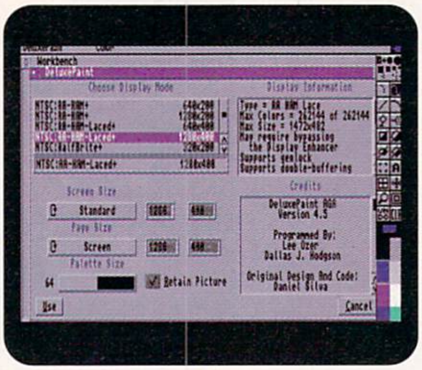
Hard-drive installable.
Not copy protected.
Accelerator compatible.
AGA compatible.
Requires Amiga DOS 2.04 or greater (does not support Kickstart/Workbench1.3), 2MB RAM, 2 floppy drives or hard drive and one floppy drive.

AGA version of DPaint IV graphics software.

Much to the delight of Amiga 1200 and 4000 owners, the AGA version of DeluxePaint IV has arrived! Owners of earlier Amigas can also use it, but you're limited to the colors and modes your original or ECS chip set provide.

Installing to floppy-disk or hard-drive systems is simple. First-timers must enter name, company, and registration number, which are then coded into the program and become a nuisance, as they pop up each time you start the program. A totally new screen-format requester checks your Devs/Monitors drawer and makes a scrolling list from the dozens of new screen modes that accompany the A1200 and A4000. My limited list, for instance, contained 60 options.

This same requester provides other helpful information, including maxi-



DeluxePaint IV V4.5, supports all the new AGA graphics modes.

mum pixel size and colors available in each mode. A slider controls palette size, while a cycle gadget shows overscan options, with text-entry gadgets for custom pixel dimensions. One problem with this requester, however, is that the screen mode always defaults to my 640×200 Workbench resolution, whereas all my graphics require overscan and interlace for my specialized video applications. On every startup, therefore, I must scroll through 60 choices to find my selection. The addition of a user-defined default Preferences setting would be nice.

Gonzo Graphics

As the name implies, DeluxePaint IV AGA supports the new graphics chips, so you can create, manipulate, and convert images in every AGA resolution up to 1472×482 pixels. With my A4000 and 1960 multisync monitor in place, I have all the original Amiga color options at my disposal, plus the new 256-color and HAM8 262,000-color IFF formats. You can now also load IFF24 images.

Don't be misled, however, for you still need a 24-bit display board to view images in true 24-bit detail. DPaint will simply load and convert a 24-bit image to your current screen format for display. It performs remarkably well, particularly in 256-color and HAM8 modes. As a reference, DPaint converted 24-bit images down to 16 colors better than did Art Department Pro V2.2 using Floyd-Steinberg dithering. While the new Player utility handles HAM8 and 256-color images, it can't read 24-bit images.

Animation is available in all 262,000 colors, but animation and animbrush resolution is limited in a few cases, although this is likely to affect only those working in such exotic modes as NTSC:SuperHiRes interlaced overscan 1472×482.

Helpful Selections

Other than AGA support, other new features fall into the "handy" category. A new Rub Through feature combines Transparency and LightTable to rub an image area from the back screen to the front. Sounds great on paper, but in practice it worked only with the current background color. The difference is that the transparency setting allows a partial or "transparent" rub through. While not a true rub through, you can create some nice effects with skillful application.

The system Clipboard now uses Copy and Paste to move brushes between DPaint and other programs. You can free buffer memory occupied by spare brushes by using the Brush/Free menu selection, which can make a big difference if, as I do, you frequently use large brushes. Selecting your brush handle has also been greatly simplified. Alt-x now cycles the brush handle through all four corners and center, while Alt-z still allows custom handle placement.

With V4.5, you can move around in

requesters and make selections with the keyboard. For example, clicking the Picture/Load requester's Parent button lists the Parent directory. But now the "P" in Parent is underlined, meaning that you can list the Parent directory with the shifted-P key instead of clicking the Parent button.

Ranges provide smooth gradations with the AGA color options of 256-color and HAM8 modes, but the screen-wide dithering "show" bar formerly available from the Range requester is gone. One nice new feature is that the current color's number appears under the Selected Color box in the Range requester and the Palette. With hundreds of colors to choose from, this is a blessing.

Other refinements include the addition of an AppIcon for Workbench, plus the ability to specify Prefs Menu ToolTypes when running DPaint from a Shell. If you use TriMedia's pressure-sensitive tablets, DPaint has built-in pressure On/Off and brush-size controls. For PC users, the PBM (Packed Bitmap) files created by PC-compatible versions of DPaint now load directly into this new Amiga version.

Bad Flashbacks

Two nagging problems remain, however, from earlier DPaint versions. First, in both HAM and HAM8, menu selections are still in what appears to be pale green text highlighted in another pale green, making them nearly impossible to read. While I seldom used the old HAM mode due to fringing and lack of resolution, the new HAM8 mode is exceptionally useful and I foresee putting it to regular use. Secondly, this is the fourth version of DPaint that shows only 53 font names in the font requester, out of the 88 font styles I have available.

A call to Electronic Arts posing as a user with complaints was met with helpful advice from a knowledgeable tech-support person. He invited me to forward my suggestions, which I did.

Other than a few minor improvements, DeluxePaint IV AGA is exactly what the name says: DeluxePaint IV with support added for the AGA chip set. The absence of changes to the program's functionality allows you to start viewing and converting older graphics in the new AGA modes. DPaint is still the standard by which all other paint and 2-D animation programs are measured, and no Amiga artist, animator, or active user with an AGA machine should be without it.

—Fred Hurteau

3-D modeling, animation, and rendering software.

Caligari24

Octree Software, **$399.**

All models.
AGA compatible
Not copy protected.

Minimum system: 3MB RAM.
Hard drive and accelerator recommended.

One of the strengths of the Amiga is its sheer number of excellent 3-D programs. While some of them seem to get all the press, other fine programs get less than their fair share of column inches. Octree's Caligari24 is a case in point. The first version of Caligari was released a number of years ago, and numerous revisions since that time have improved the product. If you passed over this program once before, it's now time for a second look. ►

Unlike other 3-D programs, Caligari drops you dead center in the remarkable 3-D world. You become the camera, observering the universe from a 3-D perspective view, and as you move through this world, objects redraw themselves in real time. Octree has optimized its code to give Caligari24 users the fastest screen updates available on the Amiga.

The effect is much like a virtual-reality environment, making it a snap to set up complex scenes. If an object is too finely detailed for real-time updates, the program switches to a bounding-box display, where objects are replaced with outline rectangles. For old hands who prefer the standard fare—the top, side, and front views used by other programs—Caligari has these options also.

Functionally, Caligari differs from most Amiga software in another important way: Pull-down menus are nowhere to be found. Instead, all menu options appear on the bottom of the screen, out of the working area. If you need to access more than one menu at once, just stack them on top of one another any way you wish. While it's refreshing to see this different approach, it's a mixed blessing, for the anxious user must deal with the learning curve associated with a new interface in order to get started.

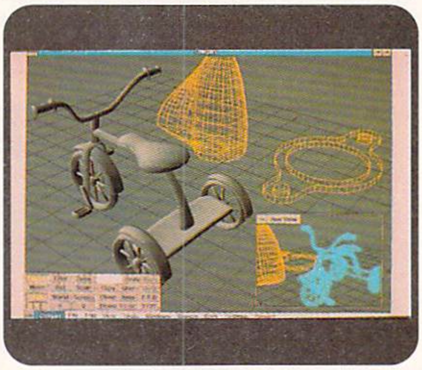
The mouse works in a different fashion as well. The left mouse button controls X and Y movement within a scene in the working area, while the right button takes care of Z movement. Thankfully, this arrangement makes lots of sense in a 3-D world, because it sure doesn't otherwise.

Mucho Modules

Caligari24 is not a small package. You'll find modules for each part of the animation process: object design, scene setup, animation sequencing, and rendering. The standout in the crowd is the object-design module. A built-in library provides 18 primitive shapes, the building blocks with which you form more complex objects. These primitives can be easily moved, scaled, and rotated in space, and if you prefer to create your own, you can switch to a point editor and build new ones from scratch. Virtually any function pertaining to primitives is available. You can extrude, lathe, connect, copy, and mirror them. And don't worry if you make a mistake; an Undo button undoes the damage.

Some of the better modeling functions are unique to Caligari. The sweep function adds new polygons that project from the originals. Slice adds a new cross-section to an object. Care to pinch an object in the middle? Just add a new cross-section slice and scale it smaller. There's even a quad-divide tool that breaks down an existing polygon into smaller pieces.

Yet, while these tools are powerful, they pale next to the organic deformation module, which places a deformation box, constructed with as many points as you wish, around your geometry. Moving a point of the box distorts the original geometry. Just grab a point and twist or deform the box, and the original object twists and deforms in the same way. The results are very natural, with the object taking on a clay-like consistency that permits incredible manipulation.



While it may take time to adjust to Caligari24's interface, the effort is worth it.

After warming up in the modeling arena, you move into animation staging, where the virtual-world interface comes into its own. Select an object with the mouse, move it wherever you want, and then click on the Set button, which sets a new keyframe for the animation. You can then slide through the sequence to whatever frame you want, move the object to a new position, and then click Set again—giving you your second key. This quickly results in a very complex series of moves, and it couldn't be easier.

You can also view the object's motion path, which appears as a white line in the scene area. If it's too irregular, you can smooth it with a click on the spline button. Should you need more detailed information, you can view all the keyframes graphed on a timeline. You can generate wireframe previews of the entire sequence and then view them with a VCR-style control system. Moving the mouse back and forth plays the animation forward and backward. All this power and flexibility is both intuitive and easy to access.

Rendering: The Final Frontier

The last module on the list is for rendering. You can set every object with different colors, transparencies, textures, and shaders. You can place textures with an easy-to-use utility program and project them on your object in several different ways—from planar to spherical. Caligari24 also allows for cubic-environment maps, where you can map every side of the world—including the ground and sky—onto your object. The effect is extremely realistic, giving the finished picture a ray-traced appearance.

Yet another powerful option is the choice of shaders. Most programs use only Phong shading, but Caligari24 also lets you choose Gouraud for speed, or Cook-Torrance (metal) for realistic, shiny surfaces. In addition, all the common framebuffers are directly supported. You can render to DCTV, HAM-E, Firecracker, Harlequin, IV-24, OpalVision, and the older Mimetic's Framebuffer. Even Targa cards connected to an Amiga bridgeboard present no problems.

There's a lot to praise here. Caligari supports all standard Amiga display modes, including HAM and the new AGA. The manual is one of the best I've ever seen for any product. Installation is straightforward, and an extra version is included that works on older, unaccelerated Amigas. After lots of use and abuse, the software remained rock solid.

Caligari24's one glaring weakness is the lack of direct, true-color IFF support. Rendering to a 24-bit IFF file means jumping through a few software hoops. You begin by selecting the Null Framebuffer to render the picture in 32-bit Rendition format and then save it. To create an IFF file from the 32-bit image, you must load it in with an image converter such as ASDG's Art Department Professional, and then change it into IFF format. For such a powerful package, this awkward procedure seems like an oversight. (*Editor's Note: Caligari promises a free upgrade in the near future for 24-bit IFF output.*)

Another shortcoming is multitasking—it's virtually nonexistent. Caligari24 disables the rest of the OS while it's in action. You can open a Shell window, but that's about the limit to real-time multitasking. Thankfully, when you quit Caligari, background programs will be idling as you left them.

Despite these glitches, Caligari24 is excellent. New users and those curious about 3-D animation should look here first, and experienced Amiga animators should be delighted with the organic deformations and other great features. All in all, Caligari24 is a real contender in the Amiga 3-D wars.

—Derek Grime ■

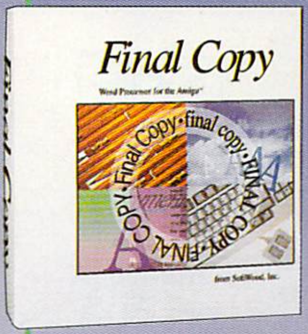
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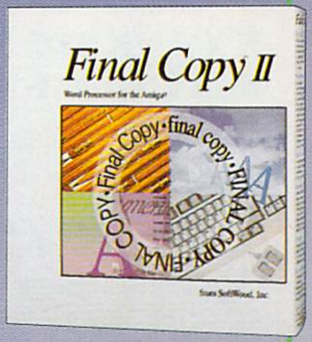
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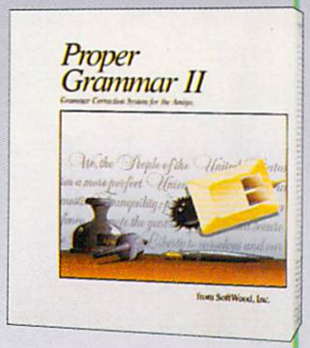
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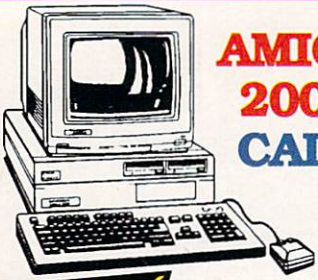
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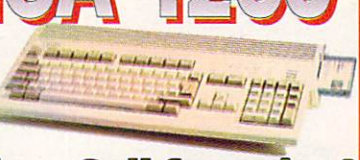


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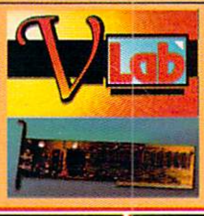
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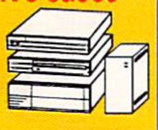
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The Game Preserve

By Peter Olafson, AW Games Editor

Lemmings II: The Tribes

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LEMMINGS WAS NOT simply a game. When it was unleashed on a puzzle-starved Amiga world early in 1991, it created a sensation. Someone cooked up a freely-distributable Operation Wolf-style game in which you had equal time to kill the critters instead of saving them. Sane people with families and day jobs dressed up in Lemmingwear. Among Amiga gamers, the question, "Have you seen . . . ," invariably was followed by the question, "How do you solve . . ." And like all sensations, it spawned many an imitation (see p. 78 for a sampling)—little men run amok—and demanded a sequel.

The sequel is here at last, and it's not simply a data disk in the style of Oh, No! More Lemmings. DMA Design lingered eight months over **Lemmings II: The Tribes** (***Psygnosis***, $59.99), and its work has been amply rewarded with another classic in miniature. Lemmings will never feel brand new again, of course, but this follow-up manages to capture the sweetly exuberant, creative spirit of the original—and add a wealth of new features—without seeming more than necessarily derivative.

It's a natural extension of the original game, and the basic concept is the same. The Lemmings are still little strolling thingamabobs with smooth faces and Theodore Chipmunk's wardrobe, and they're still on an intercept course with disaster. You use the mouse to bestow skills upon individual Lemmings that—you hope—will permit the lion's share of the brood to make it from the entry trapdoor(s), through an obstacle-ridden landscape, to an exit. Fall too far, and the Lemmings go squish. Fall in water, and they go glub. And so on.



Oh, no! They're back! And just as dumb, but lovable, as ever, in the circus world of Lemmings II: The Tribes.

Everything's bigger and better here, though. The amusement park that is Lemmings II makes the original look like Jumpman. You've probably gathered from the title that there's more than one type of Lemming in here. In fact, doomed Lemmings Island is a pie divided among 12 distinct tribes—Egyptian, Medieval, BeachBum, Space, etc.—and you'll need to rescue at least one Lemming from each to complete a talisman that secures the escape of civilization as the little green-haired guys know it.

It's also tougher. The new levels are sizable, and often scroll

Continued on p. 80

CRIB NOTES

It wasn't difficult to settle on Shadow of the Beast III (*Psygnosis*, $59.99) over Shadowlands for this month's Crib Notes. After all, Beast II casts a huge shadow; I still receive occasional mail about the crane puzzle. This time we'll tackle the first level, and move up from there next month.

Level One (the Forest of Zeakres) is actually pretty standard bash 'em-up-type stuff for this otherwise puzzle-like game. Run right—you can't go left anyway—and you'll soon find yourself in hostile territory. This is no time to be casually losing energy, so nail the plants shooting purple slime at you—they're the quivery ones that look like planets—and head for the elevator. Ride it to the top and head right again.

Get the gold, blast the critters heading for you, and, continuing right, shoot the wheel three times to bring the hanging platform up to your level. Then hightail it to the grenades, which you'll need to take out the guns on the four moving platforms farther to the right.

As you ride those platforms, you'll notice that down and to the left there's another gold cache behind a locked door, which you can open with the key on the far-right platform. Now head right again, across the moving platforms, until you find a sort of goblin outpost. There's evidently an inexhaustible supply of them, so kill the ones that are doing immediate damage, climb up to the lookout, and then jump off the right-hand edge.

Well, now I've gone and done it, eh? Put you right in the middle of the goblin camp, and they seem to be coming at you every which way. Fortunately, they're not very hardy creatures, and a sharp eye and good timing will prevent your precious little store of life from becoming too greatly diminished. You have bigger fish to fry. Head right and you'll come upon a piece of meat roasting on a spit. Shoot it repeatedly to knock it down, and then push it until it's squarely under the swinging spiked block.

Along the way, you'll collect another key that goes to the cage—the one with the big critter inside it—to the far left. Release the mon-

Continued on p. 80

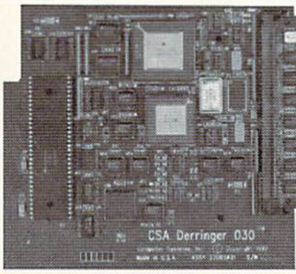
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Continued on p. 78

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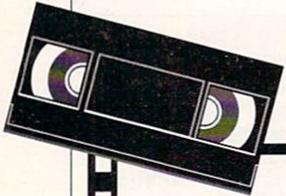
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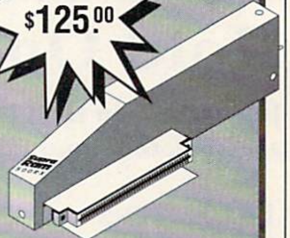
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Hold On—There's More!

Just when you thought it was safe, the addictive Lemmings imitators are here, too—and most of them are quite good.

TRODDLERS

B+
1.2/1.3 ✓ *
2.0 ✓
3.0 ✓
Not hard-drive installable.
Copy-protection.

TRODDLERS (***STORM***, about $40) is getting on in age now, but I have to mention it, since it's the most unabashed of the Lemmings-inspired games—essentially a hybrid of Lemmings and Spherical whose little critters are cheerfully free of the requirements of gravity. (Walking on ceilings seems to be their natural state.) They stick where Lemmings fall, and your job is to provide a surface all the way to the exit. Not as complex as Lemmings, it's nevertheless exceptionally stylish—it has that Amiga inner glow—and well done.

PUSHOVER

B
1.2/1.3 ✓*
2.0 ✓
3.0 ✓
Hard-drive installable.
No copy-protection.

PUSHOVER (*OCEAN*, $49.95) is more its own creature. It's essentially a game of topple-the-dominoes, of all things, with the chief toppler and domino-organizer being a soldier ant named, uh, G.I. ANT. G.I. can lug most of these spotted blocks around, including up and down ladders to other platforms—except the trigger block, which is immovable and must be the last to fall.

It's unexpectedly challenging (certain dominoes have unusual properties), it's tightly focused (each level is confined to one screen), and it's cute (love the way they give you the level codes). And behind Robocop 3-D it's the best game Ocean has brought over since it started handling its own distribution here.

GOBLIINS 2

B-
1.2/1.3
2.0 ✓
3.0 ✓
Hard-drive installable.
Copy-protection.

GOBLIINS 2 (*COKTEL Vision*, about $40)—itself a sequel—is from a different tribe entirely. It's closer in spirit to traditional adventure games. Get the object, use the object, discover the object doesn't work in this situation, yell something nasty at the screen. You supervise two goblins—who are maneuvered individually with the mouse—and two livelier, goofier faces you've never seen on computer-game critters.

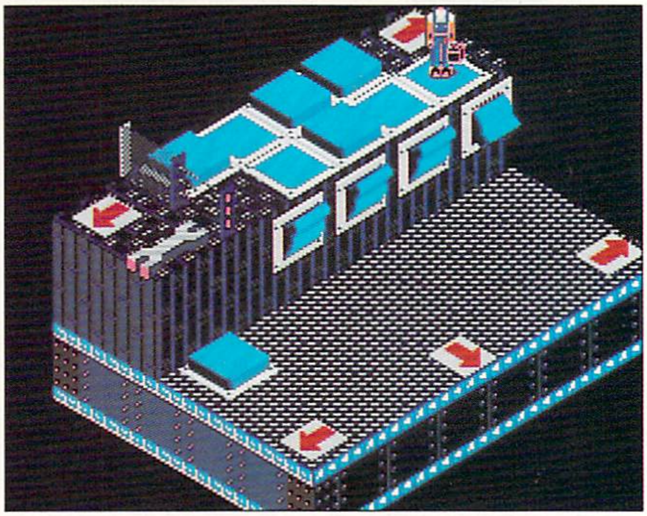
That goofy look carries over into the game. The designers have evidently thought out all the consequences of doing the wrong thing, with the result that the game is engaging and fun even when you don't know which end is up. Gobliins 2 just won't stand still. Take too long to click, and Fingus and Winkle peer from the screen in bemused anticipation, or do backflips.

I do wish the story had a spark of originality. (A demon has kidnapped the king's son . . . hmmm.) It's not as logic-oriented as other members of this troop—governed more by a text-adventure-like willingness to try anything and everything under the sun—but it's big enough that you'll appreciate that it'll go on hard disk.

CONTRAPTION ZACK

C+
1.2/1.3 ✓
2.0 ✓
3.0
Hard-drive required.
No copy-protection.

FINALLY, THERE'S **Contraption Zack** (*Mindscape*, $39.95)—the only US-made game in the bunch. Zack's the new boy on the job, and his co-workers have pulled a little initiation rite and scattered his tools throughout the plant. His task is to recover them while repairing various dysfunctional systems, and that's a tall order, since the plant is a regular minefield of interlocking puzzle rooms. You'll need to hop on pressure pads to lower floor spikes, ride catapults to rise above them, and



Factory life can be tough, but it's challenging fun in Zack.

pull switches to reverse conveyor belts. And, once the tool box begins to fill up again, you'll find ways to put it to use as well.

Lovingly done up in 64 colors and a Populous point-of-view, and equipped with a rapidly rising difficulty curve, it's immensely agreeable stay-up-late stuff. It installs on hard disk. (Indeed, it's one of a handful of Amiga games that require one.)

And yet, in technical terms, Zack could use a few repairs. The speed on an unaccelerated A500 is sluggish—while this sort of game ought to be the Amiga's bread and butter—and even on an A3000/25 it slowed down when Zack walked during a machinery animation. I'd recommend a fast machine. The joystick routines seem unreliable when dealing with Zack's menus, and the clipboard notes on a player's progress were rendered in a virtually unreadable color scheme on my A500.

A critically important detail on saving games is missing from the printed documentation. It seems you can't save Zack just anywhere—only in certain specified areas. But you're not told that when you try to save outside those areas. The info appears only in a text file on Disk One—a spot usually reserved for manual addenda rather than essentials. ►

To locate vendors of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 94.

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From p. 74

in several directions. And simply completing a level—there are ten per tribe—may no longer be enough, as you now bring to the next level only the number of Lemmings who survived the previous one. (Hence, if your stock of Lemmings falls too precipitously, you may be unable to maneuver beyond a certain point.) And there's now a reward for doing especially well: The talisman pieces are gold, silver, and bronze in the style of Olympic medals.

At the same time, it's easier to get the hang of Lemmings II. There's a practice mode where you can chose eight skills and try them out without heed to time or technique. No more burdensome password system; now you can save your progress to disk. It's no longer purely a life or death affair; Lemmings can now fall and be knocked temporarily senseless—hence the little blue dots spinning around their heads. You don't have to wait for the clock to run out anymore once you've saved the Lemmings, and there's a little clover-like fan to help certain Lems breeze to their destinations—an evident tip of the hat to Lemming-cousin Bill's Tomato Game.

The 55 different skills are a scream; they make the game something to simply play around with as well as solve. Beyond the usually mundane Lemmingesque tasks like tunneling and bridge building, the visitor in Lemmingland may witness Lemmings surfing, firing bazookas, throwing spears, wielding clubs the size of several Lemmings, hovering above the ground on angel wings, being fired from catapults, and paddling little Lemming-sized canoes. If you ever wished hopelessly for a way to pass a certain obstacle in the original Lemmings, it's here. (Of course, the obstacles are that much more obstinate as well.)

DMA seems to have included every conceivable wish-list feature—without sacrificing any of the basic fun. In fact, my three-disk version of Lemmings II was missing just one: hard-disk installability. That's expected to be included in the NTSC version sold in the US. As the English would say, this is brill.

CRIB NOTES

From p. 74.

ster and jump on a ladder to get out of its way. Once you return right, you'll find that the beast has taken the bait, the spiked block has fallen, and your path to another gold cache is clear.

What's this little platform-ish thing beside the gold, then? It's basically another elevator—but rocket-powered and semi-steerable. You'll want to have it bear left, but level out before you reach the boulder that's waiting midway up the shaft, so as to carry the boulder up with you. (If at first you don't succeed, try again; the platform and boulder will still be there.) At the top, head left (pushing the boulder), drop the rock over the precipice, and follow it down.

Seems you've landed onto one of those weight-driven platforms so common in Sonic- and Super Mario-type games. If you've gotten this far without snagging the boulder first, you know your weight doesn't tip it quite far enough to the left to allow you to jump to the ledge on the other side. (A side note: You're free to go down the ladder before the edge and explore the Monty Pythonesque underpinnings of the mechanism. There's even a semi-useless switch you can throw.)

With the boulder, however, you're in fine fettle, and should be able to make the leap with ease. The wall that erupts behind you is a clue that you've entered the endgame for this level. Head left up the hill, pausing between the metal rods that pop out of the ground.

Over the bridge and past the statue, at cliff's edge, you'll find the ground crumbling beneath you, dropping into an arena for a standoff with a giant flying demon. Hey, can we talk this over? Actually, he's kind of a wienie. Just jump out of the way when he fires on you and keep up a steady stream of shurikens yourself, and he'll soon be history. Take his skull as a souvenir. □

GP Continued on p. 84

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ToolChest Exclusive!

The Disk Magazine for anyone who has an Amiga and likes music!

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From p. 74

SHORT TAKES

NIGEL MANSELL'S WORLD CHAMPIONSHIP

B+
1.2/1.3 ✓
2.0 ✓
3.0 ✓
Hard-drive installable.
Copy-protection.

Give me a sec while my brain floats back into normal position. There. Whew. This driving game from England's *Gremlin Graphics* (about $45) is quite the little runabout. On a basic A500, it's just cumbersome enough to feel realistic. On an A3000/25, it's a holy terror. Build a cabinet around it and you could put it in an arcade. The only thing flashing by faster than the trackside scenery was my life when I zoomed into a hairpin turn at something over 200 KPH.

Like other recent speedy driving games, NMWC is a hybrid of action and strategy. Unlike any of them, it goes on hard disk, which speeds up disk-loading. Too bad the codewheel copy protection slows it down.

It doesn't have a track editor—it's tied to a Grand Prix Circuit—and the view doesn't have quite the depth of field of some of the competition (namely, Core Design's Jaguar XJ220 and Gremlin's own Lotus III). But I'm not complaining—especially not with an AGA-specific version inbound.

HOOK

D
1.2/1.3 ✓
2.0 ✓
3.0 ✓
Not hard-drive installable.
Copy-protection.

Steven Spielberg's syrupy yarn about a yuppified Peter Pan rediscovering his roots arrives on the Amiga as an animated adventure (*Ocean*, $49.95) with easy-going icon controls, graphic inventory, lots of conversations (albeit rendered in a difficult-to-read color), on-line hints from Tink, and the occasional delicious graphic detail. Initially, it'll put you in mind of The Secret of Monkey Island, and nothing which does that could be entirely awful.

But this simply isn't much fun. It feels oddly dead on its feet—as though it's waiting around for you to interact with it. The graphics look like leftovers from Darkman and The Untouchables. And we don't need another four-disk game that doesn't go onto hard disk. Hook, you're a schnook.

NICK FALDO'S CHAMPIONSHIP GOLF

A-
1.2/1.3 ✓
2.0 ✓
3.0
Not hard-drive installable.
Copy-protection.

I'm even worse at computer golf than at the real thing, but I love this game from England's *Grandslam* label. It's better looking than any golf game except Links (and these graphics are drawn rather than digitized). It also has nice tucked-away info screens (which pop out when you want 'em) and a sensible emphasis on the art of making contact with the ball and picking clubs (which is assumed in other games).

Caveat: It's a long load, and so would benefit from hard-disk installability. And it's a PAL program, so you'll need a meg of chip and a PALboot program to play it. (Degrader works fine.)

ROBOCOP REDUX

A-
1.2/1.3 ✓ *
2.0 ✓ *
3.0 ✓ *
Not hard-drive installable.
Copy-protection.

Great just got better. The review of Robocop 3D a few issues back was based on the European version. I've since seen the US incarnation, which is notably better. *Ocean* has replaced the dongle protection with the manual-based variety, and the manual is far more readable without the weird color scheme. Wish it worked on the A1200, though. ■

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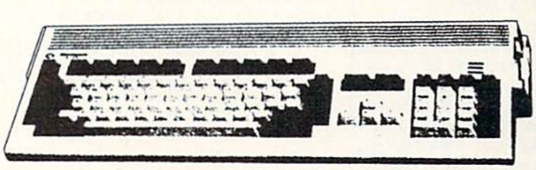
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HELP KEY

Upgrading—How to do it and when you might consider AGA. Also, some summer reading.

By Tim Walsh

Unpleasant Memory

Q. *With the recent addition of an 8MB internal RAM expander to my A500, a guru message occasionally appears, but otherwise it works well. I use my Amiga primarily for graphics and music. Should I upgrade it further or consider one of the newer Amigas? Finally, which books would be best for learning the Shell or ARexx?*

Derek M. Gans
Norfolk, VA

A. Past experience with internal RAM expanders on the A500 makes me no stranger to your dilemma. First, try to reseat the expander to make certain the connection is solid. If the guru messages persist, contact the manufacturer or your dealer. The board or one of its components may be defective. If it's still under warranty, you may be able to exchange it for a replacement.

It's a tough decision whether to continue to upgrade your A500 or invest in one of the new AGA Amigas. Last month's Help Key (May '93) listed numerous upgrade options for the machine at various price points. Many A500 users like yourself hear the siren song of the low-priced A1200. It operates roughly three times faster than your A500, has increased chip RAM for more expansive graphics and sound capabilities, offers 256 simultaneous screen colors at higher screen resolutions, and comes complete with the vastly improved AmigaDOS 3.0 operating system.

While an additional investment in AGA-specific versions of graphic programs (such as EA's DeluxePaint IV v.5) are needed, there's the benefit of added graphics capabilities. Equipment used with your A500, such as the monitor, disk drives, and external modem would work fine on the A1200.

Required reading on AmigaDOS would be incomplete without *Amiga Intern* ($39.95), a recent book focusing on the subject from Abacus (5370 52nd St. SE, Grand Rapids, MI 49512). ARexx knowledge comes in printed form via *The ARexx Cookbook* ($24.95) by Merril Callaway. You can order it from Whitestone, 511-A Girard Blvd. SE, Albuquerque, NM 87106.

Bridging the A2000HD

Q. *As the owner of an A2000HD, complete with a Bridgeboard and the standard 1MB of RAM, I'm looking to upgrade my computer. How much RAM should I add to the machine? I'd also like to know how to program the Bridgeboard and get it working properly. Lastly, which modems work well with the A2000HD? I'm interested in both Prodigy and CompuServe networks.*

Charlie Wilkins
Solon, ME

A. When it comes to adding RAM to the A2000HD, as with the A2000, it's remarkably easy. Unlike the newer A3000 and A4000, the A2000 would not accept SIMM-style RAM chips on the motherboard. Therefore, your best bet is to buy a Zorro II-compatible RAM card that will plug into any free expansion slot on the motherboard. You have a couple of options when choosing the card. You can get an unpopulated board and buy some plug-in static RAM chips for it. Just ask the dealer for RAM chips when you buy the card, or shop around for the lowest price. Once you have the chips, just press them in place in 2MB increments on the board's empty sockets. Regardless of which one you get, it's vital to make sure they're all of the same nanosecond speed rating and that you refer to the instructions for setting the jumpers so the computer recognizes all the RAM installed.

The second choice is to buy a board already populated with either 4- or 8MB of RAM. Typically, the price difference is minimal between the two, so 8MB versions are preferable. Thanks to the popularity of the A2000, finding a RAM board is easy, with offerings over the years from GVP, ICD, Progressive Peripherals, Supra, and Commodore, to name a few.

To get the Bridgeboard working, you need to get the latest revision of the Janus libraries and accompanying documentation for your Bridgeboard, which could either be an A2088 XT model, the A2286 AT, or the faster A2286 SX version. You can find the model identification etched on the Bridgeboard controller card. Janus libraries are available through both on-line sources or by contacting your Commodore dealer.

Virtually any external standard or fax modem can be connected to the A2000 via a 25-pin serial cable. Supra and US Robotics are only two of a number of manufacturers that make a wide variety of modems. Supra internal modems come complete with the latest version of ATalk III, a complete Amiga telecommunications package. To minimize desk clutter, Supra also offers a small variety of internal Amiga modems, complete with installation software. I've had great success transporting Supra internal modems between the A2000, A3000, and A4000.

Finally, concerning the networks, you need to have PC-specific telecommunication software in order to connect with Prodigy—a worthy reason to get your Bridgeboard in operation. While Prodigy is a satisfactory net, it's no match for CompuServe. Besides offering an expansive Amiga area, CompuServe has sheer numbers of on-line services, files, and areas of interest that virtually no other network can match. It's an expensive net, so be sure to check the price structures of others covered in On-line Scan, including Portal, BIX, and GEnie. ■

*Do you have a question about Amiga computing that just won't leave you alone? Pack it up and send it to Help Key, **AmigaWorld**, 80 Elm St., Peterborough, NH 03458.*

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A500-HD8+0MB/120 II	C10039	429.00
A500-HD8+0MB/213 II	C13940	529.00
GVP A530 TURBO-ACCELERATOR & DRIVE		
A530 Combo 40+1/80 II	C15072	559.00
A530 with 120 MB Hard Drive	C12376	599.00
A530 with 213 MB Hard Drive	C13950	729.00
GVP A2000 IMPACT SERIES II HARD CARDS		
A2000 Barecard	93667	159.99
A2000-HC8+0MB/120 II	C10059	389.00
A2000-HC8+0MB/213 II	C13964	469.00
GVP IMPACT SERIES II HARD DRIVE/ G-FORCE 030— 25MHz 68030 ACCELERATORS		
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Combo030-25/25/1/120	99152	799.00
Combo030-25/25/1/213	C13986	929.00
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Combo030-50/50/4/120	97589	1199.00
Combo030-50/50/4/213	C14010	1369.00
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A1230 TURBO PLUS	C15468	CALL
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DATAFLYER Express



The DataFlyer Express upgrades the Amiga 500 with a hard drive and up to 8 MBytes of memory. Just add any 3.5 inch low profile hard drive and SIMM memory modules. The controller comes in either SCSI, IDE or a SCSI/IDE combination hard drive controller. Includes all software, hardware and cables, auto-boosting, auto install, DB25 SCSI pass thru (SCSI only), and drive and power LED display. Compatible with Floptical, CD-ROM, Amax II (SCSI), Syquest (SCSI), Power PC and KCS AT emulator (SCSI/IDE), and Baseboard. (Note: Hard drive not included).

Data Flyer Express SCSI	C13116	$169.99
Data Flyer Express IDE	C13120	$159.99
Data Flyer Express SCSI/IDE	C13130	$199.99

AMIGA SYSTEM UPGRADES

AMIGA 500 CD ROM DRIVE	C12825	399.00
TENEX INTERNAL A500 HARD DRIVES		
TENEX 105MByte Kit	95724	CALL
3.5" EXTERNAL FLOPPY DRIVE.		
3.5"External Drive	89276	84.99
1MBYTE x 8 x 80 SIMMs	93693	44.95
BIGFOOT POWER SUPPLY	92898	94.95
SUPRADRIVE 500XP HARD DRIVES		
52MByte with 1MB	96445	465.00
52MByte with 2MB	96455	545.00
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512KByte kit	97255	23.95
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TRIFECTA 500 LX	C13566	CALL
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WORDSYNC SCSI INTERFACE		
WordSync interface	88673	99.95
DKB 2632 32 BIT MEM EXP.	C13812	459.00
HARD DRIVE INTERFACE FOR A1000	C13533	174.99
12 A'CLOCK for A1200	C15509	27.99

MODEMS & FAXES

GVP PHONE PAK	C10989	399.00
SUPRAMODEM 2400	96667	69.99
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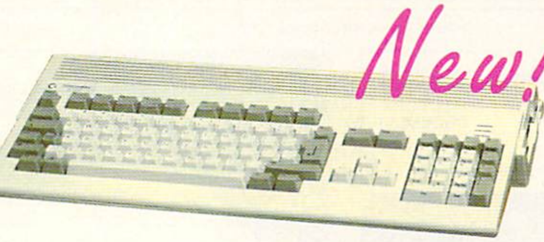
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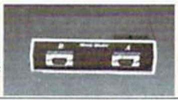
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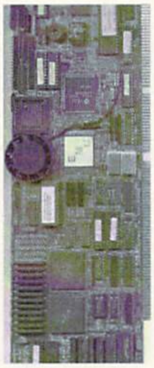
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THE LAST WORD

Kudos, complaints, comments, concerns, and contributions from our readers.

Speech Error

I keep reading that the A4000 is compatible with existing Amiga software, yet Amiga Basic software is not supported in any 2.0 or higher OS. Workbench 3.0 does not have speech so any program that uses speech will not work on the A1200 or A4000 as shipped. If you have upgraded from a 2.0 system, the immediate solution is to copy the missing files to the new Workbench. If you do not own Workbench 2.0, you will need to purchase it first. Speech is essential for educational software and it is a terrible loss that it is no longer standard.

Maggie Hettinger
Lebanon Junction, KY

If You Can't Beat 'Em . . .

As most users of Imagine already know, Impulse has begun to release a PC version of Imagine 2.0. Although Impulse appears to be targeting the lower end of the professional audience, I still think they aspire to compete with 3D-Studio 2.0, which is *the* 3D rendering and animation package for the PC. If they are to succeed at all, they will need to fully support the .DXF object format. It's up to us, as loyal Amiga users, to petition Impulse and tell them that this support is a requirement. I've already called them, I suggest that others do the same. Cross-platform data sharing assures the Amiga's survival, not it's demise.

James Schroder
Brooklyn, NY

Modus Operandi

In his article, "Advanced Operations"(April '93, p.46), Sheldon Leemon states: "By default, the chips power up in Original mode to help provide compatibility with programs that are not AGA-aware." I have purchased an A1200, and by default, the chips power up in Best Available mode. I cannot verify this information with the A4000, but I wanted this clarified for potential owners of the A1200.

Jim Maciorowski
Safe Hex International

According to Commodore's documentation, the AGA chips power up in compatibility mode, but are set to enhanced mode by the Setpatch command whenever you run Workbench. This is difficult to test since programs such as Showconfig (in the Tools drawer) always recognize the AGA chip set. My main point was that the existence of a compatibility mode makes it likely that games will work with the new graphics chips. I apologize if I suggested that the compatibility mode would ever prevent the user from taking advantage of the enhanced capabilities of the chips, which is clearly not the case.

Sheldon Leemon

> *Speech is essential for educational software and it is a terrible loss that it is no longer standard.*

Third-Party Commercials

I have never seen any TV commercials for CDTV. Come to think of it, I've hardly seen any advertising for Commodore products since the C-64 days. If they can't afford to produce commercials, I'm sure many Amiga-based production companies would be glad to make a commercial for Commodore. It would be great if Commodore could hold a contest for Amiga and CDTV commercials, and award prizes for the best ones.

Tony J. McKimm
Event Horizon Productions

It's All in the OS

Less than an hour after he brought his new A1200 home, my friend had AmigaDOS 3.0 running on his (14 MHz 68000) Blizzard board-equipped A1000. It runs about 20% faster than on the "No fast Ram" A1200. Judging by this, I can state that most of the speed of disk I/O on the A1200 is due to improvements in the OS and not to the AGA chips as you implied in one of your articles. I expect that adding fast RAM or an accelerator to the A1200 would be a whole different ball game.

Richard L. Smith
Tampa, FL

Middle East Relations

I bought a paint program more than a year ago and immediately sent in the user registration card. For some reason, I didn't receive a response. Maybe the US companies think it's too much trouble to handle Israeli customers, but if they give proper customer support, I will continue to buy their software.

Nir Hermoni
Qiryat-Ono, Israel

I would like to express my gratitude towards GVP Inc. for their fast response to a problem that I encountered that was not even their fault. I bought the G-Lock from a dealer in the US, but upon receiving the package, the disk included was completely damaged. I sent them a fax telling them of the problem, and within ten days I received a replacement disk. Not many companies look after their overseas customers, but GVP has been outstanding towards us.

Ahmed Balfakih
Jeddah, Saudi Arabia ■